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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

Third Interim Report

Part I

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Executive Summary

When the European Union increased in population by 28 percent and expanded its territory by 34 percent on 1 May 2004, new challenges and possibilities of the enlarged Union have advanced to the forefront of European spatial development, particularly with regard to cohesion policy and sustainable economic, social and ecological development. For this fifth wave of enlargement, the process of integration of new member states into the EU has been an ongoing task for the European Union - a process of cohesion, assimilation and convergence that was begun many years prior to the accession date and will continue on for many years to come. Yet enlargement also represents one of the most important opportunities for the EU as a whole to increase international competitiveness, and through sustainable growth, become the most competitive and dynamic knowledge based economy in the world.

Effects of enlargement and integration are already being seen and these present, not unsurprisingly, a mixed bag of results: Growth rates in the enlargement area[1] are above the EU15 average, but real economic convergence remains limited. Economic restructuring is occurring in the enlargement area from primary sectors to the service sectors, but employment levels have fallen.

The spatial challenges and possibilities that enlargement poses have not taken the Union by surprise, as indeed efforts towards enlargement have been forthrightly underway since the process to develop the European Spatial Development Perspective (ESDP) began in 1993. ESPON 2006 is one of the current efforts to address the spatial tissue of the Europe in its near entirety (EU 27+2) with its mandate to indicate, map and diagnose spatial development of the European territory.

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. If we assume this to be so, then one of the territorial tasks of the enlargement process is to utilize the tool of polycentric development to boost competitiveness, social and economic cohesion and conservation of natural and cultural resources.

ESPON 1.1.3 takes up the particular effects of enlargement on the polycentric spatial tissue with special attention on the discontinuities and barriers implicit in this process.

In order to do this, we ask ourselves the following relevant research questions:

[1] By enlargement area we mean the 10 new member states, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia, also referred to as EU10, or EU12 when we include Bulgaria and Romania as the next candidates.

- Which are the current process of polycentric development in the enlargement area?
- What is the existing diagnosis of the spatial tissue in the EU-25 with special emphasis on the EU-10?
- Where are the particular areas at risk in the Enlargement area with regard to sectoral specialization?
- What are the special needs of border regions in the enlargement area with regards to barriers inhibiting flows?
- What are the possible futures of the enlarged European Union with regard to accessibility to promote polycentricity and performance of regions?
- In response to processes induced by EU enlargement, what policy combinations at all levels are (or could be) efficient in order to enhance competitiveness in all parts of the EU?

In addressing these questions we employ statistical methods to measure polycentricity according to the indicators of size, location and connectivity to ascertain how polycentric Europe, and particularly the Enlargement area actually is. A study on the Transnational Regions and Transnational Urban Networks (TUN) takes polycentricity a bit deeper and shows areas of the Enlargement area with the potential to compete with the Pentagon. We then take a step back and set the stage for enlargement by making a diagnosis of the European (and particularly the Enlargement area) to determine the spatial trends. This includes visualizing economic and population redistribution before enlargement, examining convergence/divergence trends in the EU10, and analysing the degree of spatial association of regions. A focus is placed on the risks and opportunities of enlargement by measuring the regional specialisation and geographic concentration of sector employment in the EU-12 and drafting typologies for particularly vulnerable regions. The special needs of border regions are highlighted with typologies based on the particular barriers to flows of people, goods, services and knowledge. We then take a forward-looking perspective via two complementary scenario studies on the effects of selected EU policies on the Enlargement area. Finally we present preliminary “policy combinations” to enhance the polycentric development of the Enlargement area.

I.1 Normative objectives and multi-level spatial governance

The objectives of the ESDP, competition, cohesion and conservation (or sustainability) are not strictly codified in terms of EU policy legislation. Spatial development policy, in which these three objectives are operative, is still the formal and legal domain of national and local governments. However, while the EU does not have full competence in the area of spatial development, it has been active in producing a set of common objectives or *norms* for the area. We will address these objectives as *norms, or normative objectives,* which prescribe or proscribe the range of acceptable actions for an actor (governmental or non-governmental) that adheres to a certain identity, in our case a European identity. As Kratochwil (1989: 11) states, "Norms are therefore not only "guiding devices", but also the means which allow

people to pursue goals, share meanings, communicate with each other, criticize assertions, and justify actions."

These "norms" also guide the scientific ESPON efforts and to a large extent also policymakers on the EU, national, regional and local levels. Europe "should" be one of the most competitive areas in the world, capable of sustainable growth. Social and economic cohesion in terms of levelling out socio-economic disparities throughout the European space is an honourable and synergistic task. And careful husbandry of the natural and cultural resources upon which our economic and social systems are based is an imperative. While these normative statements appear obvious and indisputable, their integrated manifestation in spatial development policies is not always easy to facilitate. In any situation there can occur a conflict of interest with regard to the weighting of these normative goals. At the same time these normative goals may be interpreted or valued differently by various levels of governance in implementing or adopting spatial policies.

In the process of enlargement, which is the focus of ESPON 1.1.3, certain conflicts are coming to another magnitude than ever before. E g, the weighting of environmental objectives to economic goals are very different in new EU-regions trapped at the poverty level. It is a primary task for EU spatial policy to translate its "norms" leading to a common understanding across the Enlargement area.

Thus the call for reiterated by the Commission, policy analysts and the ESPON programme for a system of multi-level governance. The effects of policy interventions directed towards achieving polycentricity will have various effects on different levels, and these effects must be analysed. Indeed the vertical integration of policy interventions is a great challenge due to the wide variety of territorial concerns and institutional capacity in the nations and regions of the Enlargement area.

Horizontal integration of sectors and planning areas to achieve the goals of a regional development strategy is not a straightforward task - at the European level or at the regional level. To produce synergies among the three normative goals of the ESDP it is necessary to create novel means of at least coordinating, if not integrating, diverse policy and planning sectors such transport, competition, agriculture, environment and culture.

I.2 Polycentricity and Enlargement

Polycentrism is both an analytical concept and a policy option The ESDP as well as ESPON put a widely accepted political objective: to counterbalance the "Pentagon" and "over-development" of some cities and regions at all territorial levels of the EU space. Thus, we need to give priority to the study of those elements of the analysis of the role of the cities (and urban systems) in spatial development.

A major polycentrism challenge in EU is to reinforce the development of major urban regions and Transnational Regions of Integration (TRI) outside the "Pentagon" so that they become capable of competing with this 'European core area". Actually, major urban regions of the enlargement area are weaker than their EU15 rivals and the level of integration of the

Transnational Regions (TR) of the enlargement area is lower than that of the TRs of the EU-15. So, while the polycentrism policy should cover the entire EU territory, a much stronger effort – and funding - should be paid in the case of the enlargement area. The nature of the urban regions' problems also differs in the enlargement area compared to the EU-15,for instance, transport infrastructures necessary for the networking between urban nodes are weaker in the case of the new countries.

Taking a closer look at the particular European level of polycentricity in relation to the Enlargement area we find only few accelerators or "potential MEGAs"[2] in the enlargement area that could compete with the Pentagon, the most important being the capital cities of Warsaw, Budapest, Prague and Bratislava. However, considering actual trends as well as the impact of the new TEN-T, we could discern the following spatial entities (Transnational Regions (TR) / Transnational Urban Networks (TUN) / Cities) of the enlargement area which could "compete" with the Pentagon:

- The potential **TR formed by the three small Baltic countries** containing the potential TUN of Tallinn, Tartu, Riga, Daugavpils, Vilnius and Kaunas. This TR will have to strengthen its relationships (complementarities / networking) with the rest of the Baltic area, Poland and the "Triangle". The emerging cooperation with the Russian enclave Kaliningrad is of uttermost importance to strengthen, not least for environmental concerns in the Baltic Sea. Subsequently an intensified networkning with St. Petersburg is of high prioriety.
- The **"Triangle of Central Europe" TR with potentially high level of integration and encompassing the area from Warsaw in the east**; Poznan (and possibly Berlin) in the west; and Krakow, Saxony (Dresden), Prague, Bratislava, Vienna and Budapest in the south. It contains the potential MEGAs: Berlin, Vienna (European engines), Warsaw, Budapest, Prague ("Potential MEGAs" today), Krakow, Wroclaw, Bratislava, Poznan, Lodz and Szczecin ("Weak MEGAs" today). This TRI has to strengthen its relationships with the "Pentagon", the wider Baltic area, Poland and the Balkan region.
- The potential **Transnational Region of Integration containing the** "**Triangle" as well as some neighbouring countries / regions**: eventually the rest of Austria, Czech Republic, Slovakia and Poland as well as the territory of Slovenia.
- The potential TR of the **INTERREG IIIb cooperation area "CADSES".** While there appears to be great potentials in the Enlargement area for boosting polycentricity in terms of transnational regions for competing with the "Pentagon", the question remains of how polycentric the enlargement area actually is today.

In both ESPON 1.1.3 and 1.1.1 a methodology has been developed by measure polycentricity. For this a comprehensive indicator of polycentricity consisting of the components size, location and connectivity was defined.

[2] Metropolitan European Growth Areas (MEGAs)

In ESPON 1.1.3 the method was applied to functional urban regions (FUAs) in the accession countries. Table 1 below shows the three component indices and the Polycentricity Index for the accession countries (Malta was excluded because it has only one FUA).

Table 1: Component indices and Polycentricity Index of accession countries

Country	No. of FUAs	Size Index	Location Index	Connectivity Index	Polycentricity Index
Bulgaria	31	77.1	80.2	52.6	68.5
Cyprus	4	75.7	100.0	89.1	87.3
Czech Republic	25	79.2	51.7	63.5	63.6
Estonia	10	64.7	94.8	26.4	54.3
Hungary	77	61.6	57.7	50.4	56.1
Lithuania	8	76.5	83.5	18.5	48.9
Latvia	8	35.5	97.0	52.4	56.3
Poland	48	84.1	83.1	58.7	74.0
Romania	59	78.3	80.9	46.6	66.3
Slovenia	6	76.0	91.6	72.0	79.1
Slovakia	27	83.5	77.0	41.6	64.2
AC12 average	304	77.5	77.1	52.7	67.1
EU15 average	1,200	77.7	57.2	68.1	65.9

- **The accession countries on average have more polycentric urban systems than the old EU member states. This is primarily due to the location index. The connectivity index of the EU10+2 is much lower than in the EU15**.

The most polycentric accession countries are Poland and Slovenia. The Baltic states and Hungary are the least polycentric accession countries.

Polycentricity so defined is associated with major policy objectives of the European Union: Countries with a polycentric urban system are in general economically more successful and environmentally more sustainable than countries with a dominant capital city, but not necessarily spatially more equitable if also rural regions are included.

In conjunction with ESPON 2.1.1 the method was further developed to forecast the impacts of transport policy scenarios on polycentricity. It can be observed that the:

- **polarisation of the urban systems in the accession countries has increased since their transition from planned to market economies in the 1990s and is likely to increase further in the future.**

This creates serious goal conflicts for future EU spatial policy oriented at a balanced polycentric territorial structure of Europe (see Table 2). If, for instance, the goal is to strengthen major urban centres outside the 'Pentagon', this will increase spatial disparities between the already too dominant capital cities in countries, such as the Baltic states, Hungary or the Czech Republic. However, if the promotion of balanced urban systems in these countries is a common goal, substantially more Structural Funds and transport infrastructure

would have to go into the peripheral regions of the new member states, and this would go at the expense of their capitals.

Table 2: Goal conflicts of polycentricity policies for accession countries

Goal	Policy	Goal conflict
Competitiveness at global scale (Lisbon)	Strengthen highest-level global cities	Polarisation between the global cities and the rest of Europe will increase. The European urban system will be less balanced and polycentric.
Cohesion at European scale	Strengthen major cities outside of"Pentagon"	The competitiveness of the global cities in Europe may decrease. The urban systems of individual countries will be less balanced and polycentric.
Cohesion at national scale	Strengthen medium-level cities in accession countries	Competitiveness of major cities in the accession countries may decrease.
Sustainability	Strengthen lower-level cities in accession countries	Competitiveness of major cities in the accession countries may decrease.

I.3 Spatial diagnosis of Enlargement

As in the field of medicine, no good doctor would portend to give an assessment of health without first making a diagnosis of what ails a patient. An essential part of the work being performed in 1.1.3 is the detection of discontinuities and divergence in the enlargement process. For this diagnosis we first step back and visualise a snapshot of economic and population distribution of the enlargement area in relation to the EU27 on the eve of accession, both at the meta (EU27/ESPON space) level, and at the meso (national and regional) level. To capture "micro"-level processes that are operative at a national scale we study the banking sector and Foreign Direct Investment (FDI). As a vital part of the diagnosis of the spatial tissue of Europe, we then examine the spatial association of development patterns in Europe.

Macro-level diagnosis

The 1990s has witnessed important shifts in the spatial centre of gravity of both the economic and demographic structure across Europe. At the macro-level we can distinguish the position of the Enlargement area in relation to EU27 regarding changing contribution to population and GDP. However, statistical observations of the total NUTS 3 regions in the ESPON space for our purposes are only available for the years between 1995-2000; a period too short to allow for conclusions within a long-term economic cycle. Yet the visual examination of spatial trends in population and economic terms indicates that by understanding the ESPON area as a market entity:

- The three Baltic States have suffered significant population losses during the last decade. At the same time the Baltic States enjoyed strong growth during the period in many regions and hence could improve their contribution to total ESPON GDP significantly. The success is based on growth in capital regions disfavouring other parts of the countries. Yet the capital regions together have the possibility for creating polycentric dynamic macro-region
- Poland's pattern of population gain is diversified, with the regions at the Baltic Sea gaining significantly and Warszawa, Posznan and Gdansk as loosing their positions. But in terms of wealth contribution to the total of the ESPON space it almost entirely on the rise. Polycentric developments are assumed to have contributed to the total favourable wealth contribution at least to some extent, but determining this would preclude the use of a detailed case study.
- The urban system of the axial extension of the Global Integration Zone (GIZ) of EU-15 - i.e. Czech Republic, Slovakia, Hungary and Slovenia largely form a carpet of relative loss of population in general. But while the Czech Republic faces dramatic losses in GDP contribution (except for Prague), this monocentric structure cannot be recognized in Slovakia and Hungary. Slovenia is gaining in wealth.
- Romania and Bulgaria are almost entirely losing in population and perform as an economic decreasing carpet in ESPON terms, with Varna, located at the Black Sea coast and being the only exception.

Meso level diagnosis

At the meso, or national/regional level we investigated the convergence/divergence process with regard to regions within the EU15 and the accession countries. It is obvious that :

- In the new member states GDP per capita on average has been growing, but that the gap between poor and rich regions has been widened at the same time.

Particularly in the Baltic States, the Czech Republic, Hungary, Poland and Slovenia, dispersion in GDP per capita has grown significantly between 1995 and 2000. Variation among regions is more apparent within the 10 accession countries than within the EU15 member states. Only Greece, Italy and Portugal show some signs of convergence.

Apart from economic convergence, policy makers should pay an interest to social convergence. A high GDP per capita does not automatically imply a low unemployment rate. In for example Madrid and Rome, high GDP per capita goes along with high unemployment rates. In those regions many inhabitants do not benefit from economic welfare. Regions with low GDP per capita together with low unemployment rates also occur, particularly in Portugal, Central Europa, and parts of the UK, Ireland, and Sweden. In EU10, large parts of Hungary, Romania and Cyprus have relatively low unemployment, while in i.a Poland, the Czech Republic, Slovakia and the Baltic States have relatively high unemployment as the situation stood in 2000.

Micro level diagnosis: Sector specific

At the micro-level, or sector level, we identify the effects of the enlargement process on economic and urban structures in a context of financial and monetary integration and how this affects polycentricity.

Banking sectors in most of the new EU Member States differ widely from those of the Western countries due to their past. During the socialist period banks were primarily bookkeepers for the planned allocation of resources. Thus the decision for the allocation of credits was not taken by the banks, but by the planning system. Today they are on average to a higher degree concentrated, state owned, but also show a high degree of foreign penetration. Nevertheless financial systems in new EU Member States are still heavily bank-based. Stock markets still play a secondary role compared to the banking sector within the financial systems of those countries. Spatially, bank based systems are generally more polycentric than finance based ones. Moreover a polycentric banking system can irrigate in a better way the whole economy of a country. A liberalisation process and the corollary

- **move to a more finance based system generally provoke the concentration of financial activities in the main financial centres at the national scale as well as at the international one. Peripheral regions and SMEs could therefore suffer from credit rationing.**

If we look at FDI inflows received by the new EU Member States we notice that in 2001 three countries caught almost 80 percent of FDI inflows: Poland got the most important part (almost 34 percent) followed by the Czech Republic (29 percent) and Hungary (14 percent). All the others countries got less than 10 percent of the whole. The poorest position is occupied by Latvia with 84 EUR per head. Nevertheless if FDI inflows certainly contribute to the growth of a country their effects can strongly vary sectorally and geographically. It is an understatement to say that they are not generally spread homogeneously on the territory of a country – East European capitals provide by far the most attractive sites for foreign investors.

Spatial Association - the spread of development patterns

It is part of the established wisdom in spatial studies that regions with similar development patterns, either positive or negative, tend to locate close to each other. In an integrated Europe, and especially as a consequence of the EU's recent eastward enlargement, this kind of spatial dependence can be expected to strengthen. Regions become more and more closely connected due to constantly increasing mobility of goods and production factors, as well as through intensifying interregional cooperation among public and private agencies, businesses and institutions. In the EU cohesion policy context, this raises a growing need for analysing the spatial aspects of regional growth, as well as for incorporating the implications of the results into the policy recommendations. The demonstration of spatial association aims at measuring spatial patterns of regional disparities across the ESPON space by means of the Moran I spatial autocorrelation statistic (see methodology section).

The results of this exercise emphasise the importance of spatial proximity with respect to the evolution of regional disparities across European space. For all the three measures of regional growth, a positive univariate spatial autocorrelation is detected. This means that growth rates of regions are characterised by neighbourhood dependence:

- **the more a region is surrounded by regions with positive dynamics, the higher is its own growth rate.**

This clearly manifests a need both for a systematic analysis of the role of spatial factors in economic growth, and for considering its implications for the EU cohesion policy.

There are clear disparities in spatial patterns across European space. Most countries and parts of Europe seem form clear macro clusters of economic performance. However, when we turn to look at

- **regions in the Pentagon, no systematic tendencies for clustering – at least in terms of the NUTS3 – are visible. This mosaic-like spatial pattern in the"Pentagon"can be considered as polycentric: the existing spatial regimes, both positive and negative developments, are territorially scattered and relatively small in their size.**

The results indicate some evidence for the cohesion at the macro level. The regions surrounded by regions with a low GDP per capita seem to grow faster than regions with more prosperous neighbours. This pattern is also characterised by clusters and country-effects, implying the existence of different spatial regimes between and within the cohesion countries and the EU's Objective 1 regions.

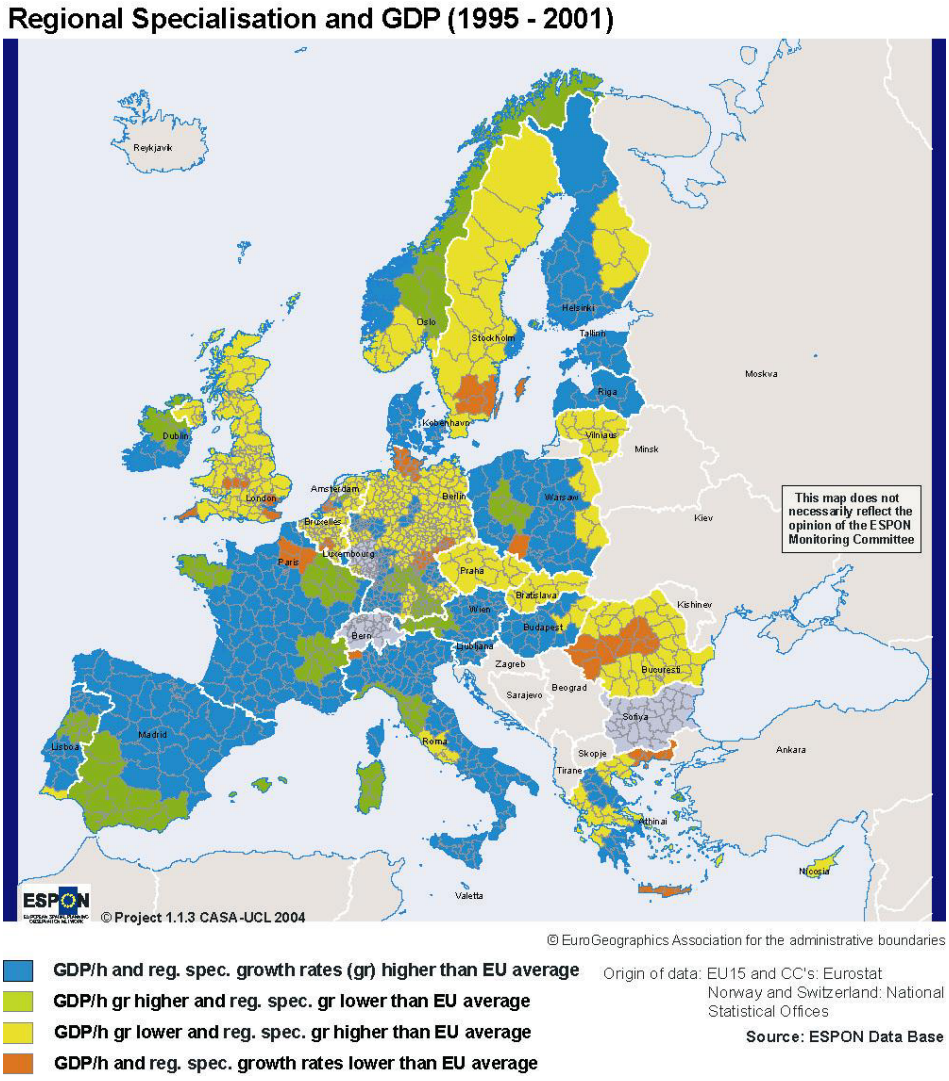
I.4 Typologies of Needs

In examining regional trends with the goal of developing preliminary typologies, we analyse patterns and trends in regional economic structure and address the growing concern about the potential vulnerability of European regions due to increasing economic integration and globalisation. The main worry is that the processes of integration and globalisation may affect the degree of regional specialisation and the geographic concentration of economic activities. If regional specialisation increases, industry-specific shocks may become region-specific shocks and sector-specific policies might become region-specific policies making regions more vulnerable. On the other hand, higher specialisation and greater concentration might lead to increased productivity via increasing economies of scale. Regional performance is also related to economic specialisation, even though the nature of this relationship changes with the economic sector and therefore caution should be used in making inferences between the positive or negative impacts of regional specialisation. We suggest two typologies: *Regional specialisation*, which describes changes occurring *within* regions and how they relate to regional performance and *geographic concentration*, describing geographic concentration as changes occurring *between* regions and at the wider geographic scales in terms of trends towards concentration or dispersion

Our analysis is based on the assumption that processes of integration and regional change are ongoing in the enlarged EU and suggests territorial typologies based on patterns and trends of regional economic structure. The objective is therefore not to provide further evidence of these processes but to identify which regions, under these circumstances, might be at risk of economic decline or potential success and to provide a framework for policy targeting. The Warsaw region is the only one in the EU10, which is growing at a higher speed in terms of GDP.

The typology for regional specialisation presented (see typology section) are nonetheless useful to reveal patterns where regions characterised by low specialisation and GDP (in Spain and Poland, for instance) are experiencing higher GDP/h growth rates and faster specialisation growth than the EU average while for most of the UK these indicators are reversed, as shown in Map 1. These realities call for the use of caution in the evaluation of policies:

Map 1: Typologies based on trends of regional specialisation and GDP per capita growth, 1995 - 2001 (EU average compound GDP/h growth rate = 1.1)



- **not all regions will respond equally to policies that promote specialisation or differentiation of the economic structure.**

The comparative analysis of geographic concentration shows that most of the transformations that are occurring within the EU15 (growth of the service sectors, decline of employment and increase in concentration in the primary sectors, decline of employment and dispersion in the secondary sectors) are also occurring in the new member states. But:

- **within the boundaries of the EU12 geographic system transitions as growth of the service sectors, decline of employment and increase in concentration in the primary sectors have both a faster pace and a stronger manifestation.**

This leads to the tentative conclusion that policy combinations at EU, national and regional level already implemented in EU15 to strengthen positive specialization – where appropriate – or diversification – where that is the appropriate remedy, could be expected to work also in the new member states. Another plausible recommendation is that:

- **since the needs are much stronger in the new member states than in the past, the policy has to be loaded with much more resources and more targeted than in the past to be efficient.**

Along with each spatially relevant trend elaborated in this report comes the pressure to adapt to changes leading to reorganisation of the national and European urban system(s) at varying speeds and levels. Finding appropriate remedies for strengthening specialization/diversification or dealing with restructuring of the economic base in the Enlargement countries demands further typologies for the various structural types of regions.

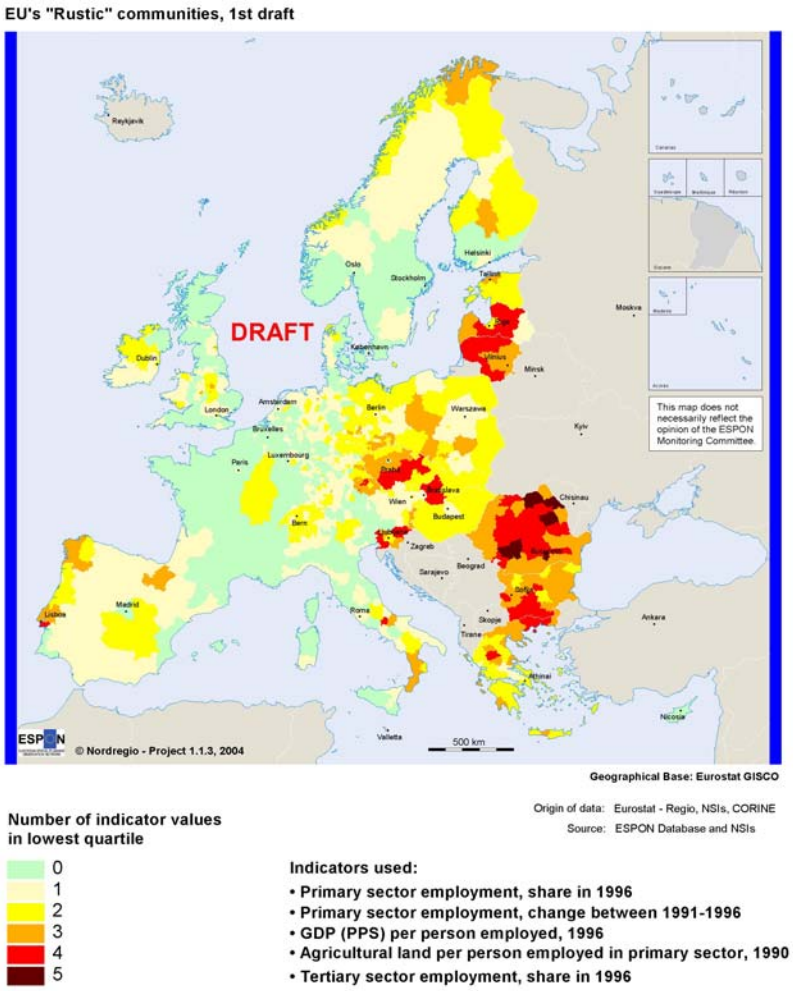
Against this background we set out to apply a composite perspective asking where in the ESPON space there are structural types of regions that may be in need of various policy interventions to attain the normative territorial goals of competitiveness and cohesion, in particular when taking into account the EU's enlargement. Hereby we seek to identify parts of the territory that are likely to be problematic in the development of a spatially balanced polycentric structure, allegedly crucial to contributing to realisation of these normative territorial goals. In order to target the regions of the ESPON space we focus on those characteristics allowing for complete quantitative observation at NUTS 3 level and this involves a range of indicators (see methodology section). We identify "Fringe", "Shrinking", "Rustic" and "Rust belt" communities. Assumptions are made for particular types of regions for which enlargement may mean extraordinary pressure to reorganise their urban structure in a way counteracting the development of a balanced polycentric spatial tissue across the ESPON space.

- "*Fringe*" Communities: Regions with peripheral location, low population density, low level of economic wealth and currently slow growth rate are expected to be less attractive for private investors and qualified mobile labour than other regions.
- "*Shrinking*" Communities: Regions with poor demographic structure, negative population trends and low population mass and density are involved in a negative

spiral of cumulative causation, with declining regional markets for the private sector and increasing per capita costs for public services.

- "*Rustic*" Communities: Regions specializing in the primary sector, with low income levels and a slow rate of structural transformation in the recent past, but now moving towards secondary and tertiary sectors are more likely to experience poor economic growth rate in the near future than other agriculture-dominated regions (see Map 2 below). We assume that the slow rate of transformation from the agrarian economy in the past reflects the fact that the manufacturing and service sectors did not find these regions attractive as economic locations in the pre-accession situation, when international competitions was less fierce than after enlargement.
- "*Rustbelt*" Communities: We assume that current low income and technology levels in the manufacturing industry will not attract new industrial investments as much as in other manufacturing regions.

From a more qualified typology, we will – in the Final Report - address more in detail policy orientation to all three territorial levels. In particular, we expect to specify where the needs are most alarming and where the EU has a justifiable role, i a industrial areas undergoing conversion; urban areas in difficulty; areas facing specific geographical or demographic handicaps and cross-border, transnational and interregional co-operation.



Map 2: "Rustic" Communities

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. Different components of border characteristics in the border regions of the EU enlargement area are dealt in more detail, by analysing the geographic type of borders, ethnic-historical types of borders, density of border crossings, economic disparities and the membership in Euroregions and transnational Working Communities. These are the basic components for elaborating first draft typologies

for “border typology for integration potential” trying to identify on NUTS III level forerunners, hardworkers, candidates of integration and handicapped for integration.

Because of the wide variation in border region types and the inability to gain hard data on various types of flows of people, goods, service and knowledge, this study will be enriched by in the Final Report by in-depth case studies of border regions lying along the (former) EU borders, border regions along the border between two new member states, border regions lying at the external EU borders in order to understand qualitatively the unique processes of integration, the changes of border region position in the national development structure and the vehicles and barriers of integration for these regional types

I.5 Scenario studies of effects of enlargement

To forecast the effects of enlargement, two scenario studies are conducted in ESPON 1.1.3 using two different but complementary forecasting models of regional socio-economic development:

-The RESSET model used in Scenario Study 1 is a new model which is designed for ESPON 1.1.3. It is a sketch planning model which enables any casual user with a view about the future urban and regional development of the ESPON space to engage in information speculation: to explore the scenario space.

- The SASI model also used in ESPON 2.1.1 is a model of regional socio-economic development particularly designed to show the impacts of European transport policies.

The two models will be made as much as possible comparable by using a harmonised spatial database and similar assumptions about the overall economic and demographic development of the enlarged European Union as a whole.

The scenarios to be simulated with the two models will be defined in close co-operation with other ESPON projects, in particular the spatial scenario project ESPON 3.2.

Scenario Study 1

RESSET simulates change in the European space at three levels: first at the entire EU29 level which involves a demo-economic forecasting model of the 29 countries based on simple extrapolation of population and employment under various plausible scenarios about aggregate growth rates – fertility and mortality, net migration and economic development. The second model is a spatial simulation of growth and change in population and employment at the country level but is informed by accessibilities and relative regional level attractions. The third model effectively moderates the forecasts made at the two higher levels by factoring in urban and rural differences as well as the unevenness of national development.

Some early examples of ‘What If’ Scenarios have been defined. These are radical long term scenarios as follows:

- Policies to move jobs from Western Europe to the east: injections of employment at levels of 15 percent or more in the key eastern countries of Poland, Czech, Slovakia, and Hungary. This we assume is a consequence of a declining agricultural base and the need for subsidy to bring employment levels back up.
- The natural growth of western Europe, particularly the Low Countries, UK, France and Germany from East Asian and North American investment, presumably in financial services and related tertiary, quaternary and quinary sectors, adding 15% to employment levels.
- The growth of the south in terms of migrating population to Greece, Spain, Portugal and the islands, adding 15% to these population levels.

So far , we have tested four scenarios including the extrapolation of the calibrated (1996) situation with a view to examining the long term steady state in terms of the attraction of population and employment to each of the 29 countries. We summarise our findings as follows:

- The largest accessibilities are in the areal core of the New Europe and our model picks this up, shifting population and employment towards this heartland in the absence of inertial factors which mitigate this redistribution. This is the essence of the trend projections
- There are considerably less spill-overs from new activity in different countries into other countries than we expected.
- There is a tendency for the west to capture more activity than the east even when the east is favoured in terms of investment/subsidies in employment
- There is a general spreading of activity throughout the new Europe which is tantamount to a redistribution from large to small countries and from peripheral to core, with the exception of Scandinavia and the Baltic States that appear somewhat of an exception, capturing activity from Poland and Germany.
- The migration south scenario benefits the west rather than the east but the two non-EU countries Switzerland and Norway, appear to benefit most from any of the scenarios tested. This is probably due to their inclusion in the model rather than any innate advantages which are built into the model
-

Scenario Study 2: impact of TEN-T and TINA projects on the regions in the new member states.

A second scenario study assesses the impacts of the TEN-T and TINA projects on the regions in the accession countries. The method used is the regional economic model SASI .In ESPON 1.1.3 the SASI model is used to forecast the socio-economic development of the regions in the accession countries after their entry into the European Union taking account of the expected reduction of border barriers, such as waiting times and customs procedures and of different scenarios of implementation of the TEN-T and TINA projects.

As a preview of the kind of information to be expected from Scenario Study 2, the results of two scenarios of special relevance for the new member states and one additional scenario with an extended list of transport infrastructure projects in the accession states are summarised as follows:

- Transport infrastructure improvements in the accession countries and between the accession countries and the old EU member states contribute to bridging the economic gap between the old and new member states.

- Transport infrastructure projects that improve the transport corridors between the old and new member states are more important than transport infrastructure projects within the accession countries.

- Transport infrastructure improvements designed to reduce spatial disparities at the European level are likely to increase spatial disparities within the accession countries at large or within individual countries..

- Except the transport pricing scenarios, all transport policy scenarios examined so far in ESPON are likely to accelerate the decline in polycentricity in the accession countries.

These tentative results will be substantiated during the final year of ESPON 1.1.3.

Particular emphasis will be placed on the comparability of the results of the two models. This will be achieved by early co-ordination of the spatial and temporal resolution and scope of the two models, the specification of comparable output indicators and the definition of common background scenarios for the policy scenarios to be examined. The work will conclude with policy conclusions and recommendations based on the results of the two models.

I.6 Recommended Policy combinations

We emphasize that the policy recommendation process must take into account the problems encountered when making spatial development policy that is centered around normative (rather than legal or regulatory) concepts such as polycentricity, cross-border cooperation and cohesion. This leads to the need for policy recommendations that are both on a multi-level dimension and inter-sectoral in nature. We thus suggest the concept of “Policy Combinations” or an integrated policy making approach, as a complement to policy “recommendations”. As there is little theoretical research in the area of making policy recommendations in the field of spatial development, we attempt to take on “the art and science” of policymaking and explore an approach that is based on two very different rationales (inspired by the field of neo-institutionalism) for making policy combination: the *principle-based rationale* and the *capacity-based rationale*. The principle rationale is basically a coordinated sector approach with a top-down perspective, while the capacity rationale is territorially based and largely following a bottom-up logic. This leads us to a range of general policy recommendations, or combinations that, with regard to the key findings of this report, bear on the case of the effects of enlargement of the polycentric spatial tissue of Europe.

I.6.1 Principle-based policy combinations

As for concrete and combined policy actions, we recommend

- In a long term perspective, **transport infrastructure investments** in the new member states and particularly between new and old member states are of primary importance to increase competitiveness and cohesion in the EU as a whole. Large EU transport network investment will contribute to strengthen the capital regions of new member states and thus establish a more polycentric development at the European level.
- Infrastructure developments should also **strengthen the potential Transnational Region formed by the three small Baltic countries**. Deepened cooperation with the Russian enclave Kaliningrad is important for environmental concerns. Intensified networkning with St. Petersburg and Kiev is of high prioriety.
- Polycentricity at the European level should increase by **promotion of the network of major cities in the "Triangle of Central Europe",** with its potentially high level of integration and encompassing the area from Warsaw in the east; Poznan in the west and Budapest in the south. This Trananational Region has to strengthen its relationships with the Pentagon, the wider Baltic area, Poland and the Balkan region.
- GDP growth in major cities and city regions in the new member states does not necessarily reduce unemployment or prevent social exclusion. This calls for for **intensified and focused urban policy programmes** for more and better jobs in both capital and second tier cities.
- Promote the **multiplier effects of R&D centers**. In many of the enlargement countries universities and research centers operate in isolation from their immediate surrounding, although their findings, innovations and ideas have the potential to be implemented locally.
- Large scale infrastructure improvements alone are not sufficient for significantly reducing the economic disparities between the old and new member states; they have to be integrated with other policies of the European Union. Transport policy scenarios examined in this report are likely to accelerate the decline in polycentricity within in the new member states and accession countries, i e overpromoting capital regions. This points at the need for **policies to improve the second rank cities' functions**. This is in line with the suggestions put forward in ESPON 1.1.1 TIR. This is a field for cooperation between all the three levels, the EU, the nation state and the regional centres. Transport investment should not be concentrated only alongside international routes. Links connecting major centers between and inside new member states are almost if the same importance. Corridors concentrating both internal and international traffic should be a priority investment.

All new member state should be invited to draft **national programmes for regional development with emphasis on the functional growth of second tier *cities***. EU funding should be provided to partnerships formed at the regional level - both to draft the plan and to secure its implementation. Small member states should profit from drafting plans in

cooperation with neighbouring states. Plans should be based on analysis of the potential function and contribution to positive spatial association of the second tier cities.

Such plans should include policies aiming directly to *generate employment* in second and lower order cities and towns (cf 1.1.3 SIR):

- Decentralize government employment
- Create new public institutions

A second group of policies focuses **new transport infrastructure in selected cities**:

- Intensively develop regional highway networks focusing on major regional centres
- Route new high speed rail lines to serve selected regions
- Intensively develop local transport accessibility, including sustainable transport options such as bicycle paths linking communities and regions.

A third group of policies builds on increasing importance of **culture, leisure-based tourism and sporting activitie**s to the economies of cities and regions:

- Attract major one-off events with longer term development potential
- Deliberately develop a cultural or tourist role based on existing natural and cultural resources in regional centers or second-tier cities. Development of tourist networking possibilities (natural, cultural, historic) for cities and regions with similar experiences
- Restore historic tourist quarters

I.6.2 Capacity-based policy combinations

A final group is more general in scope and address the issue of **creating "soft" links** between functional regions in order to improve polycentricity, competitions, cohesion and sustainability by facilitating the exchange of information and knowledge between regions in and bordering the enlargement area.

This report highlights the improvement of transnational cooperation/networking as important means of counterbalancing concentration in the core of the EU, especially in the case of the enlargement countries where the ability to implement spatial development goals is may be low. The INTERREG III programmes and other EU external funding sources are currently addressing these issues. In light of this, policy combinations for capacity-building could include:

Macro level policy combinations:

- Explore the use of the **Open Method of Coordination (OMC)** as a mode of governance to a greater extent in EU spatial strategies. The call for this has already

been heard[3] and with the non-regulatory character of spatial development in the EU, the flexibility, openness and plurality of actors encouraged in the OMC, this may give some legitimacy to the inherent multi-level processes of spatial development. Particularly in the Accession countries, regional and local conditions are necessary prerequisites for developing national plans to encourage polycentricity and cohesion.

- **Fortified Rural Development Policy focusing on the enormous needs in EU's Rustic communities.** These regions are specializing on primary agriculture, have low income levels and slow rate of structural transformation towards secondary and tertiary sectors. They are more likely to experience poor economic growth rate in the near future than other agriculture dominated regions. To meet the needs in these and other agricultural regions, EU's RDP should be broadened to focus more on *sustainable rural development* and suggest possibilities to support funding the often risk-filled attempts to switch to more environmentally-friendly methods of agricultural production. The RDR budget in old and new member states should be adjusted to the particular needs for rural development and environmental management.
- **Extended Neighbourhood policy** should be directed towards the border areas that are handicapped for integration, ie those with an already low intensity of transnational activities and low economic disparities, or those that have difficult or inaccessible borders. As the European Neighbourhood Policy and New Neighbourhood Instrument are planned to take into consideration the "new" neighbours of the European space, efforts should be focused in conjunction with the Tacis and MEDA programmes.

Meso Level Policy combinations

- The national and regional level could benefit from **capacity-building for identifying developing and monitoring EU-funded cross-border, transnational and interregional projects** in the enlargement regions. Capacity building of regional and local administrations may be necessary to empower these regions with the skills needed to recognize opportunities and suggest plans for EU-funded projects, manage programmes and evaluate results. Development of communication mechanisms and methods to promote transparency and greater stakeholder participation are also key aspects of this capacity building.
- By means of national policies, extended social policy should be developed to **secure key service provision** in Europe´s Shrinking regions to make them more attractive. The EU should provide guidelines for which services should be considered as minimum standard for service accessibility in small town Europe. **'**Shrinking' communities have poor demographic structure, negative population trends and low population mass and density, will be less attractive for private investors and qualified mobile labour than other regions. We assume that such regions are involved in a

[3] For instance, A. Faludi's call for linking OMC and Spatial planning "Spatial planning for the future development in the European Union" Paris, 20-21 January 2004. ULI Land Use Policy Forum Report.

negative spiral of cumulative causation, with declining regional markets for private the sector and increasing per capita costs for public services.

- At the national level encourage programmes to **increase cooperation *within* regions of the Enlargement countries,** dependent or independent from EU-funding. In many of the Enlargement regions, efforts go into transnational or transregional cooperative schemes, but the intra-regional cooperative forums need to be highlighted as opportunities for local exchange, benchmarking and mutual learning.

Micro-level policy combinations

- **Encouraging cross-sectoral capacity implementation at, regional and local levels**. While agendas and strategies for sustainable regional development in most of the EU address the importance of cross-sectoral issues (such as climate change) there are few tools to implement these. In this respect regional/local institutional or administrative capacity may benefit by the introduction of **horizontally placed *"Development Councils***" entrusted with the job of coordinating the expected effects of policy and planning on the normative objectives of competitiveness, cohesion and conservation (or the economic, social and environmental aspects of sustainability).
- Encourage **Local Agenda 21 plans** to adapt a spatial dimension to sustainable development, for instance the importance of accessible green corridors within and close to major urban areas, bicycle paths linking major transport hubs. Local Agenda 21 plans could also emphasize the importance of seeing the natural and cultural heritage as an economic asset, in terms of developing alternative energy sources, environmental innovations or cultural tourism.
- In regions/subregions facing severe problems ("fringe", "rustic" and "shrinking" communities) there is a need for an integrated development approach, in which the main axis/focus should be a settlement/urban oriented policy, **applying the principle of polycentrism at local scale** (ie. townships, villages, hamlets). This would include cooperating and networking in complementarities, generating some thresholds and synergies at the very local level.

Scientific Summary

This section summarizes the main concepts and methodologies, typologies and indicators used in determining the effects of enlargement on the polycentric spatial tissue of the EU.

II.1 Concepts, indicators and methodologies

We have chosen to link together the concepts, indicators and methodologies applied in this report since at this stage of the work the concepts have been refined to such a degree that they are now best described in terms of the indicators available for our purposes. For more concept definitions please see the FIR and SIR of 1.1.3 as well as the glossary in the Annex in Part III.

II.2 Measuring Polycentricity

The developed approach measures polycentricity by identifying three dimensions of polycentricity: the size or importance of cities (population, economic activity), their *distribution* in space or location and the *spatial interactions* or *connections* between them:

Size Index

It can be shown empirically and postulated normatively that the ideal rank-size distribution in a territory is loglinear. Moreover, a flat rank-size distribution is more polycentric than a steep one. Finally, a polycentric urban system should not be dominated by one large city.

To operationalise this, two sub-indicators were defined: (a) the slope of the regression line of the rank-size distribution of population and (b) the degree by which the size of the largest city deviates from that regression line. When calculating the regression line, all but the largest city are considered.

Location Index

A second step in the analysis of polycentricity is therefore to analyse the distribution of cities over space. One possible approach is to subdivide the territory of each country into service areas such that each point in the territory is allocated to the nearest centre – such areas are called Thiessen polygons. Thiessen polygons can be constructed by dividing the territory into raster cells of equal size and to associate each cell with the nearest urban centre. In this way the area served by each centre can be measured.

In the present analysis airline distance was used to allocate raster cells to centres. As measure of inequality of the size of service areas (e) the Gini coefficient of inequality was used. The Gini coefficient measures the degree of inequality of a distribution between zero and one (or zero and 100), where zero indicates perfect equality and one (or 100) maximum polarisation.

Connectivity Index

For measuring interaction potential, here the multimodal accessibility of FUAs calculated for ESPON 1.1.1 was used. Two sub-indicators were defined: (f) the slope of the regression line between population and accessibility of FUAs and (g) the Gini coefficient of accessibility of FUAs. The two sub-indicators have similar meaning: the flatter the regression line, the more accessible are lower-level centres compared to the primate city, and the lower the Gini coefficient, the less polarised is the distribution of accessibility.

II.3 Evaluation of polycentricity

With the three component polycentricity indices, the Size Index, the Location Index and the Connectivity Index, a comprehensive Index of Polycentricity can be constructed.

For each sub-indicator a z-shaped value function was defined by specifying at which indicator value polycentricity is zero and at which it is one hundred. Within this range linear interpolation was performed; outside the range polycentricity is zero or one hundred, respectively. Table 3 shows the threshold values defined for each of the seven sub-indicators:

Table 3: Value functions of polycentricity sub-indicators

	Rank-size distribution of population		Rank-size distribution of GDP		Size of service areas	Population and accessibility	
	Slope (a)	Primacy (b)	Slope (c)	Primacy (d)	Gini (e)	Slope (f)	Gini (g)
Indicator value at which polycentricity is 0	–1.75	7.5	–1.75	10	70	75	25
Indicator value at which polycentricity is 100	–0.5	0	–0.5	0	10	0	0

Table 4: shows the weights for the composition of the Polycentricity Index from the three component indices. Additive aggregation was used at the lower levels, whereas the three component indices were aggregated to the Polycentricity Index multiplicatively.

Table 4: Composition of the Polycentricity Index

Index	Indicator	Weights	Weights
Size	Slope of regression line of population Primacy rate of population Slope of regression line of GDP Primacy rate of GDP	10% 40% 10% 40%	33%
Location	Gini coefficient of service areas	100%	33%
Connectivity	Slope of regression line of accessibility Gini coefficient of accessibility	50% 50%	33%

II.4 Analysis of convergence: concepts, definitions and indicators

GDP

GDP = Gross Domestic Product

For a comparison between regions with different size (inhabitants) and different living standards (purchasing power) we use real GDP per capita, which means GDP per capita in Purchasing Power Standards (PPS). In Map 1 these numbers are indexed at EU-average = 100.

ß- and σ-convergence

Two concepts of convergence among regions stand out in the empirical literature: ß-convergence and σ-convergence. They concentrate on whether relatively poor regions catch up with richer ones, and how regions differ in this convergence (or divergence) process. When the focus is on dispersion in wealth between regions or nations, the concept of **σ-convergence** is probably the most useful concept. It is based on the standard deviation, across regions, of the logarithm of real GDP per capita. When the standard deviation declines over time σ-convergence applies.

Another well-known convergence concept is the so-called **ß-convergence**. It refers to the coefficient ß in the following equation:

(1) $$\hat{Y}i,T = \alpha + ß \ln Y_i,t_0 + u_{i,T}$$

where $\hat{Y}_{i,T}$ denotes the average yearly growth rate of real GDP per capita in region i between the years t_0 and T, Y_i,t_0 is initial GDP in year t_0 and $u_{i,T}$ represents the specific shocks between times t_0 and T. The ß-coefficient measures the speed of convergence. A negative coefficient denotes convergence.

The way the ß-coefficient is estimated in equation (1) is described as the concept of *unconditional* convergence. The alternative concept of *conditional* ß-convergence arises when in equation (1) extra explanatory variables are added which represent region-specific factors.

II.5 Unemployment

GDP per capita is used as an indicator for economic performance of regions, providing insight in the economic dimensions of convergence. Wealth performance indicators should indicate roughly the social dimensions of convergence. One social cohesion indicator is the unemployment rate, for which data are available through the ESPON database. Relating the unemployment rate to the level of GDP per capita in each region results into an indicator for both economic and social cohesion at the same time:

1 = low GDP; high unemployment

2 = low GDP; low unemployment

3 = high GDP; high unemployment

4 = high GDP; low unemployment,

where

low GDP	= real GDP per capita level below EU-average
high GDP	= real GDP per capita level above EU-average
high unemployment	= unemployment rate > 7%
low unemployment	= unemployment rate ≤ 7%

II.6 Analysis of spatial association

The exercise is based on the Moran *I* spatial autocorrelation measure and the decomposition of it into the contributions of individual regions. Types of local spatial association are identified and illustrated by maps.

A number of methods have been proposed to measure spatial aspects of regional disparities. One such method has been developed by the French members of the ESPON 3.1 (Multiscalar territorial analysis/Analysis of deviations). A pilot exercise of the present analysis was based on this approach, and was included in the SIR of ESPON 1.1.3. In order to give new insights into this issue, the following analysis is based on a somewhat different methodology: the Moran *I* spatial autocorrelation statistic:

$$I = \frac{n}{\sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij}} \cdot \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij} z_i z_j}{\sum_{i=1}^{n} z_i^2}$$

where z_i is the normalised attribute value of the region *i, n* is the number of regions, and W_{ij} is the spatial weight matrix, where each element w_{ij} represents the nearness between regions *i* and *j*.

In general terms, Moran *I* measures the similarity of attribute values in an area, the degree to which a spatial phenomenon is correlated to itself in space. In other words, it indicates how much two properties – locational similarity and similarity in some other dimension – vary together. The expected value for Moran's I is -1/(n-1) which approaches 0 for a large number of regions. Values of I are in the range from approximately -1 to 1. Positive values imply

positive spatial autocorrelation, a tendency towards clustering of similar values. The converse is true for negative values indicating that dissimilar values tend to appear in close association.

The dataset for this application consists of the following three variables, measured at NUTS3 level in EU27+2:

1. GDP95-00: GDP in purchasing parity standards (Euros), change from 1995 to 2000
2. GPC95-00: GDP per capita, change from 1995 to 2000
3. POP95-00: population change from 1995 to 2000

The distribution of Moran I statistics for these variables is separated into twelve different binary weights matrices. 'Rook' is a simple contiguity matrix where neighbourhood is defined by a common boundary: i.e. the element w_{ij} in the weights matrix is 1 if regions *i* and *j* share a border, and 0 otherwise. The other matrices are based on computation of the k-nearest neighbours so that he distance between the polygon centroids is used as a criterion for nearness and the K regions *j* that have the smallest distance to region *i* take on a value of 1 in w_{ij}, and 0 otherwise[4].

II.7 Regional Specialisation and geographic concentration

The methodology for regional specialisation and geographic concentration uses data on regional employment aggregated into three main economic sectors: agriculture (sectors A and B of the NACE classification), manufacturing (sectors C to F) and services (sectors G to P) for the period 1995 to 2001 for 260 NUTS2 regions (Bulgaria and Switzerland are excluded because of data limitations). The analyses are focussed on two themes:

- regional specialisation to describe changes occurring within regions and how these changes relate to regional performance measured in GDP/h.
- geographic concentration to describe territorial structures and changes occurring between regions and at the wider geographic scales in terms of trends towards concentration or dispersion.

We have adapted the definitions and indicators commonly used in studies on regional specialisation to the particular purposes of our analysis. In the case of geographic concentration we have also developed a framework for "system-level" analysis that provide insights into the trends and patterns of three different geographic systems: the EU29 the EU15 and EU12. Table 5 provides a list of the indicators used.

[4] Without any distance-based cut-off this yields to arbitrary neighbourhoods. To avoid this problem the following eight 'very isolated islands' were excluded from the dataset: ES701, ES702, FR91, FR92, FR93, FR94, PT2, PT3.

E = employment s = share i = industry j = region	
Regional Specialisation	**Geographic concentration**
- "Absolute" share: $s_{ij}^{s} = \frac{E_{ij}}{\sum_i E_{ij}}$ - Herfindahl index of regional specialisation: $H_j^s = \sum_i (s_{ij}^s)^2$	- "Relative" share: $s_{ij}^{c} = \frac{E_{ij}}{\sum_j E_{ij}}$ - Aggregate percentage employment growth by sector - Degree of concentration (measured as the slope of the rank-size curve) - Change in the degree of concentration - Ratio between the numbers of regions that have grown or declined

Table 5: Indicators used in the analysis of regional specialisation and geographic concentration

II.8 Formulating typologies

In order to target the regions of the ESPON space we focus on those characteristics allowing for complete quantitative observation at NUTS 3 level. Assumptions are made for particular types of regions for which enlargement may mean extraordinary pressure to reorganise their urban structure in a way counteracting the development of a balanced polycentric spatial tissue across the ESPON space. Each typological scoping is approached as follows:

- Step 1: Formulating a hypothesis on problematic structural types of regions.
- Step 2: Deriving a set of indicators suitable to identify those regions.
- Step 3: Classifying regions by combination of extreme indicator values.

The indicator set comprises five indicators, which depict one regional characteristic relevant to the assumption made. By looking at the extreme indicator values it can be ascertained firstly, to which extent the structure of a region may be problematic within the context assumed (i.e. number of indicator values in highest or lowest quartile) and secondly, which characteristic(s) are most relevant to give the region a problematic structure (i.e. type of

indicator value(s) in highest or lowest quartile). The more extreme indicator values (positive or negative) are evident in regions that may be more exposed to the assumed effect of enlargement.

- **Indicators for Typo 1**

I11	Accessibilty (European+EU15+AC12+National dimension)	2001
I12	Population density (inhabitants/km²)	2000
I13	Total population	2000
I14	GDP (PPS) per capita	2000
I15	GDP (PPS) per capita, relative change to EU15 average	1995-2000

- **Indicators for Typo 2**

Population change	1999
Dependency ratio	1999
Net migration rate	1999
Activity rate 15-64 years	1999
Population density per sq km	1999

- **Indicators for Typo 3**

I31	Primary sector employment, share	1996
I32	Change in primary sector employment (p.a.)	1991-1996
I33	GDP (PPS) per person employed	1996
I34	Agricultural land (km²) per person employed in primary sector	1990
I35	Tertiary sector employment, share	1996

- **Indicators for Typo 4**

I41	Secondary sector employment, share	1996
I42	Change in secondary sector employment (p.a.)	1991-1996
I43	GDP (PPS) per capita, relative change to EU15 average	1995-2000
I44	Unemployment rate	2000
I45	Tertiary sector employment, share	1996

II.9 Scenario Studies

In this chapter the methodologies for examining the regional and spatial effects of the enlargement of the European Union on the development of GDP, sectoral structure, trade, investment, employment, population and migration flows on the regions in the new member states, in particular least favoured regions and border regions, are discussed and demonstrated in preliminary examples.

To forecast the effects of enlargement, two scenario studies are conducted in ESPON 1.1.3 using two different but complementary forecasting models of regional socio-economic development:

- The RESSET model used in Scenario Study 1 is a new model that is designed primarily for ESPON 1.1.3. It is a sketch planning model which enables any casual user with a view about the future urban and regional development of the ESPON space to engage in information speculation: to explore the scenario space.

-The SASI model, also used in ESPON 2.1.1. is a model of regional socio-economic development particularly designed to show the impacts of European transport policies.

II.9.1 Scenario Study 1

RESSET simulates change in the European space at three levels: first at the entire EU29 level (EU15+CH+NO+AC12) which involves a demo-economic forecasting model of the 29 countries based on simple extrapolation of population and employment under various plausible scenarios about aggregate growth rates – fertility and mortality, net migration and economic development. This model is one that forecasts **DE**mographic and e**CO**nomic activity aspatially in Europe with respect to global and regional issues and we refer to this as the **DECO** submodel. The second model which we refer to as the **CORE** of the system is a submodel that is a spatial simulation of growth and change in population and employment at the country level but is informed by accessibilities and relative **CO**untry/REgion level attractions. The third model is a disaggregation of **CORE**, referred to as **URAL**, which involves simulating an apportionment of **UR**ban and ru**RAL** growth/change from the country level to the NUTS3 regions. This model is also a spatial accessibility-based model but it effectively moderates the forecasts made at the two higher levels by factoring in urban and rural differences as well as the unevenness of national development.

The scenarios generated by the **RESSET** Model (**RE**gional **S**cenario **S**imulations for the **E**uropean **T**erritory) are quite different in conception from those produced by **SASI**. **RESSET** is a sketch planning model that enables the user to very quickly test a scenario at different levels of detail by specifying different scales of change in population, employment, and accessibility. Whereas **SASI** is a large scale simulation model which is operated by professional model builders, **RESSET** is a sketch planning tool that is tiny in comparison, being delivered to any user over the net and designed to be run over and over again to generate a sense of the future development of Europe rather than very detailed result at the

subregional level. A demo version of the model is available at http://www.casa.ucl.ac.uk/RESSET.zip[5]. The model will continue to be developed throughout the rest of this project and the description that follows simply outlines its core and the preliminary pilot. Users are forewarned that the software is rudimentary with error checking not in place although the user friendly interface to this kind of sketch planning is a well established feature of our approach to generating scenarios, thus nicely complementing the **SASI** model in terms of detail and scale.

II.9.2 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 and GDP per capita. 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 and polycentricity indicators expressing the impact of transport infrastructure investments on the polycentricity of national urban systems are calculated.

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 1visualises the interactions between these submodels.

[5] This can be downloaded in seconds as it is only 280KB. When unzipping, users must ensure that the model ***RESSET.exe*** is in the same folder as the data set ***RESSETdata.csv***.

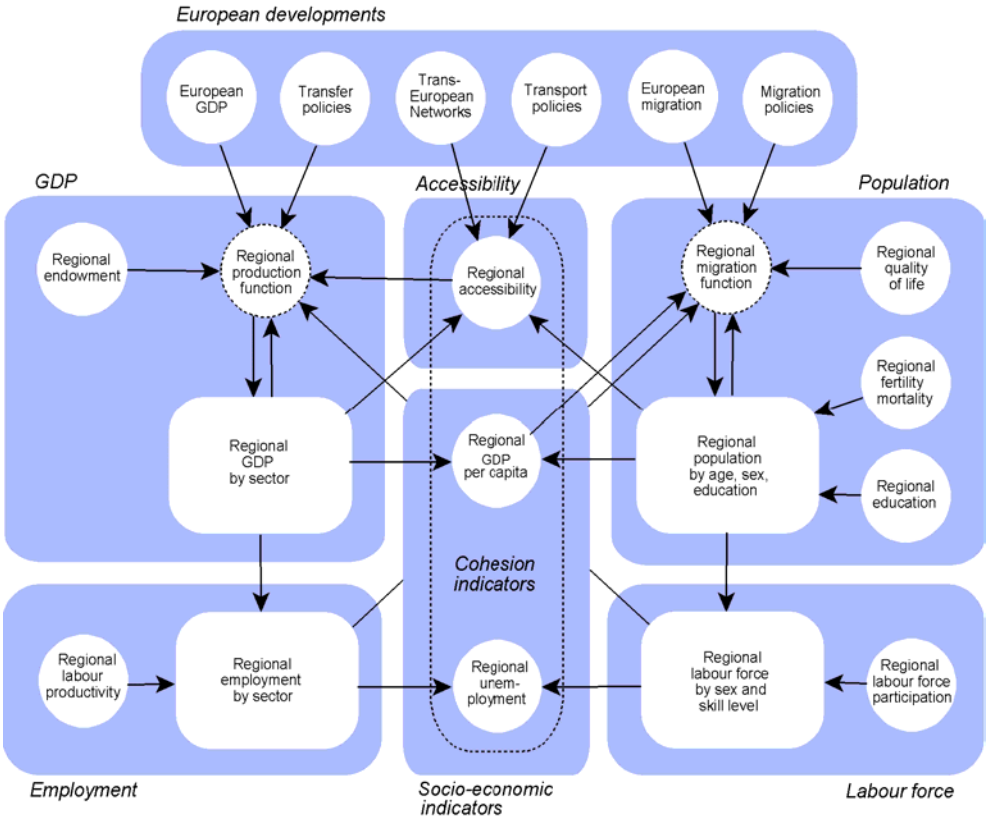


Figure 1: The SASI model

II.9.3 Typologies developed

Spatial association

Four types of local spatial association are identified (NUTS3, EU 27+2) as follows:

- GDP95-00 and GPC95-00: Univariate local Moran I
  - Positive associations: mean significance < 0.2, the same type of spatial association identified in all three weights matrices
  - Negative associations: a type of spatial association identified in at least one weights matrix
- POP95-00: Univariate local Moran I
  - Positive associations: mean significance < 0.2, the same type of spatial association identified in all three weights matrices
  - Negative associations: the same type of spatial association identified in all three weights matrices
- GPC95-00 vs. level 1995: Bivariate local Moran I
  - Positive and negative associations: mean significance < 0.3, the same type of spatial association identified in all three weights matrices

- These typologies have yet to be evaluated systematically as to their significance for enlargement and recommendations for polycentric development, in terms of "hot spots" and "cold spots" of spatial association. This is a task for the Final Report

II.9.4 Typologies of regional specialisation and geographic concentration

At the regional (NUTS2 level) the results show that higher shares in the service sectors have a strong and positive correlation with higher levels of GDP per capita but for the agriculture sector (and, to a lower degree, the manufacturing sectors) this relationship is reversed. There is however no significant relation between absolute shares (in any economic sector) and the size of the NUTS2 regions measured either in terms of sector or total employment. With regards to trends (measured as yearly growth rates) there is no significant correlation between size or change in size and change in the degree of specialisation.

Based on these analyses, two typologies have been developed. The first typology (Figure 2) identifies four groups of regions:

1. regions with high overall specialisation and higher than average GDP/h
2. regions with high overall specialisation and lower than average GDP/h
3. regions with low overall specialisation and lower than average GDP/h
4. regions with low overall specialisation and higher than average GDP/h

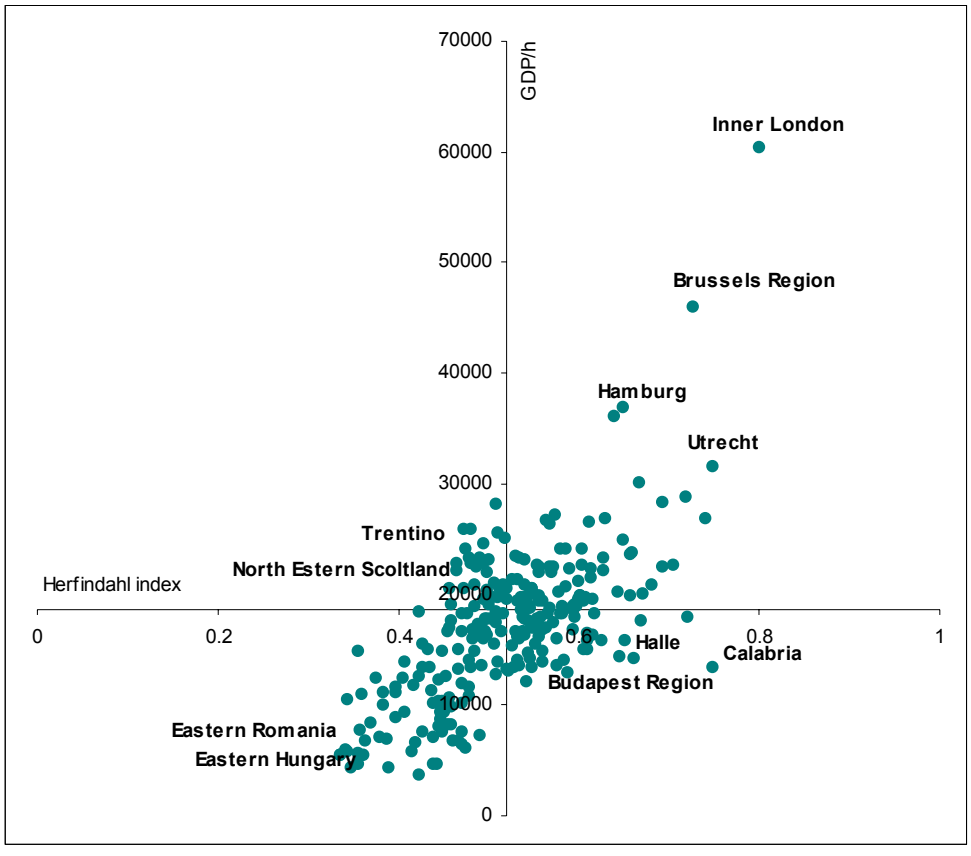


Figure 2: Diagrammatic chart of typology 1

The second typology (Figure 3) classifies regions based on trends and growth rates for the same indicators:

1. regions specialising and with higher than average GDP/h growth rates
2. regions specialising and with lower than average GDP/h growth rates
3. regions diversifying and with lower than average GDP/h growth rates
4. regions diversifying and with higher than average GDP/h growth rates

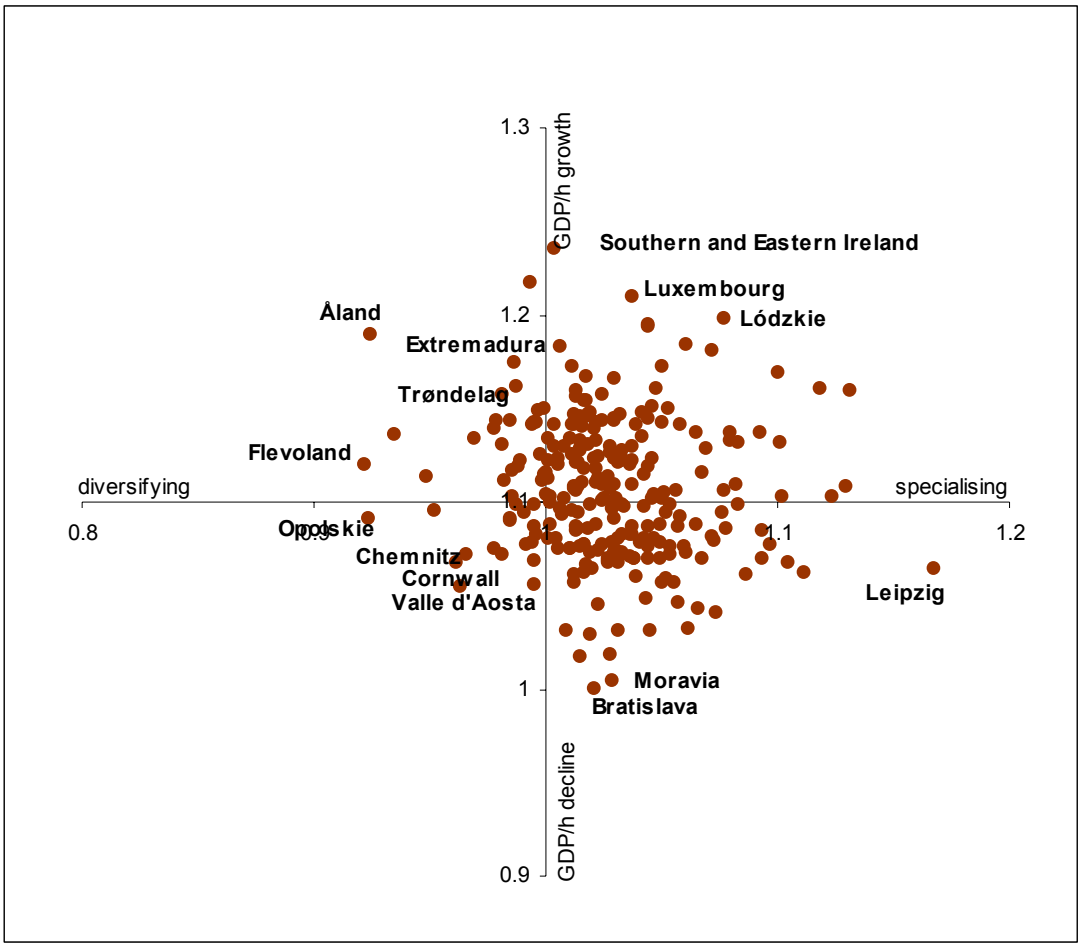


Figure 3 Diagrammatic chart of typology 2

II.9.5 Typologies of regions with needs after enlargement

EU's "**Fringe**" communities: Indicator I11 (accessibility) is used without the national dimension, which remains to be incorporated. There are no extreme 'Fringe' communities in the ESPON space having all five indicator values in the lowest quartile. However, some three percent of the ESPON space NUTS 3 regions have at least four indicator value low points. These regions are mainly located in Romania, Bulgaria, Greece, Portugal, Scotland and in the coastal parts of East Germany. Furthermore Haute-Alpes in France, the Swedish regions of Jämtland and Gotland as well as Kainu and Itä-Uusimaa in Finland also belong to this group. The region of Itä-Uusimaa located adjacent to Helsinki receives its strong 'Fringe' status

mainly due to a small total population and a relative decrease of its GDP (PPS) per capita as compared to the EU15 since the population strongly increased in the period in question

The first sample of "**Shrinking**" communities –although still based on incomplete data - provides a shortlist, which will be extended and elaborated in the Final Report. The shortlist points out one Shrinking region in Denmark, Hungary, Latvia and Poland, two in Italy and Portugal, three in Spain and Greece, and four in France, Bulgaria, Sweden, Estonia and Latvia. The regions experiencing the most complex problems associated with population change are Mellersta Norrland in Sweden, Seveoizapaden and Yugoiztochen in Bulgaria and Kurzeme in Latvia.

EU's "**Rustic**" communities: There are six regions with all indicator values in the lowest quartile. These extreme 'Rustic' communities are all together located in Romania. The very rustic communities having four indicator values in the lowest quartile can be primarily found in Romania as well as in Bulgaria, Latvia, Lithuania, the Czech Republic, Slovenia and Slovakia but even in Portugal, Italy and Greece.

The EU's "**Rust-belt**" is scoped by looking at the regional industrial structure with focus on the secondary sector. Furthermore the development in economic performance and unemployment complete the set of indicators.

II.9.6 Border regions

Using the indicators geographical type of border, density of border crossings membership in Euroregions and transnational Working Communities and level of economic disparities we have designed two tentative typologies that could capture the barriers and possibilities for various types of cross-border flows.

In the "Version 1" typology, based on density of border crossings and geographic type of border, which we could call "**Flow accessibility**", we see that quite naturally border regions that have "green" or easily passable borders with a high density of border crossings are Forerunners candidates of integration (integration here consisting of increased flows of goods, services, knowledge and cross-border cooperation and implicitly economic and social integration). Inter-regional export of goods is expected to be higher and the frequency of travel, for tourism or commuting, is facilitated. Those regions with low density of border crossings and generally less inaccessible borders are at the start *Handicapped* for integrative processes and flows. *Hardworkers* and *Candidates* for integration still have low density of border-crossings and more inaccessible borders respectively to overcome. See Table 6 and Table 7 below

Table 6: Version 1: "Draft # 1: border typology for integration potential"

Potential for change / Starting Position	**High:** Green border	**Low:** Mountain/River border
Good: High density of border crossing points	**Forerunners of integration**	**Hardworkers of integration**
Bad: Low density of border crossing points	**Candidates of integration**	**Handicapped for integration**

In the "Version 2" typology, which we could call "**Capacity flow**", we find that border regions with a good potential to change high economic disparities and a large number of transnational activities are Forerunners of integration in terms of flows of cooperation efforts, twinning schemes and/or capacity building measures. The potential for bottom-up efforts at the regional and local levels is significant. Those border regions with a low number of transnational activities and low economic disparities are "*Handicapped*" in finding suitable reasons and forums for cooperation. Since the level of disparity is low, but the number of transnational activities is high for the *Hardworkers* of integration, capacity-building projects are of less importance and cooperation schemes may focus on exchange of knowledge, best practices and experiences. The *Candidates* for integration may have good reason to engage in capacity building, but have not yet found the forums in which to do this.

Table 7: Version 2: border typology for integration potential

Potential for change / Starting Position	**High:** High economic disparities	**Low:** Low economic disparities
Good: High number of trans-national activities	**Forerunners of integration**	**Hardworkers of integration**
Bad: Low number of trans-national activities	**Candidates of integration**	**Handicapped for integration**

Networking with other ESPON projects

The ESPON 1.1.3 TPG has been working in close cooperation with a number of other ESPON projects in developing indicators, methodologies and scenarios. Since project 1.1.3 is broad in its mandate to depict the barriers and opportunities that enlargement presents for polycentricity, some parts of the project necessarily are enriched by cooperation with other more focused projects. This is seen by 1.1.3 as advantage to the ESPON programme as a whole, and also to aid on our work.

In the chapter on polycentricity we are in close cooperation with ESPON 1.1.1, as in fact many of the project partners are involved in both projects. In conjunction with 1.1.1 the method of measuring polycentricity has been developed, as well as the means of evaluating polycenticity in relation to the normative objectives of the ESDP. Cooperation with 1.1.1 has also been fruitful in the section on Transnational Regions and Transnational Urban Networks.

In the chapter on Spatial Diagnosis, the method originally used to measure the spatial aspects of regional disparities was developed by the French members of the ESPON 3.1 (Multiscalar territorial analysis/Analysis of deviations) and a pilot exercise of the analysis based on this approach was presented in 1.1.3 SIR. Since then, in order to give new insights into this issue, the following analysis is based on a somewhat different methodology: the Moran I spatial autocorrelation statistic.

The SASI model presented in the Scenario Study of the impacts of European transport policies on the Enlargement area is also used in ESPON 2.1.1.

Preliminary data for the Typology “Shrinking” communities was kindly provided by the Lead partner of 1.1.4

The chapter on Policy Combinations (Recommendations) benefited by discussions with and comments by the Nordregio partner of 3.1.

Project 1.1.3 has also been highly influenced by the reports and presentations of all of the ESPON projects, as presented at the ESPON seminars and as published on the ESPON web-page.

In January 2004 the TPGs of ESPON 1.1.3 and 1.1.4 held adjacent partner meetings in Budapest. This was a good opportunity to discuss common problems, particularly those concerning data collection. The ESPON 1.1.3 Lead Partner also cooperates very closely with 1.1.4 (and to some extent 1.1.1) with regard to project management and financial issues.

The research cooperation among the Partners of 1.1.3 has progressed quite well. Since our Second Interim Report was submitted we have had two partner meetings, one in Budapest in January 2004 and another meeting in Warsaw in June 2004. Many of the 1.1.3 Partners also attended the ESPON seminars in Matera and Lillehammer.

Further research issues

The work done by ESPON 1.1.3 for this interim report has focused on solidifying and the concept of polycentric development and in providing a diagnosis of the spatial tissue of the EU27, with particular emphasis on the Enlargement area. We are also developing drafts of useful typologies for determining where policy interventions or combinations or recommendations are potentially needed.

Our next steps will be to sharpen the typologies and to study the impact of EU and national policies on the polycentric development of the Enlargement area in greater detail, both through the final results of the Scenario Studies and via a qualitative study on governance capacity to be presented in the Final Report.

The scope of this report has largely ignored the old and new neighbours of the EU. In the final report effort will be taken to include these regions in all areas of research. As well we have not included an assessment of the "potential increase of attractiveness through urban qualities, natural and cultural assets" (Addendum to ESPON Project 1.1.3). This is being taken up by other ESPON projects and project 1.1.3 will strive to incorporate these concerns into the Final Report.

As many ESPON projects have bemoaned, it is very difficult to come by data regarding flows of people, goods, services and knowledge. In this report we have set out a typology of the various potential barriers and opportunities to cross-border regional flows, but have not actually examined the flows themselves. We will continue to work towards this and seek the aid of other ESPON projects.

Finally our policy recommendations will be sharpened and directed on a multi-level basis, pending the final results of the project.

Data requests and data gaps to overcome:

The ESPON 1.1.3 empirical work and mapping strongly focuses on data which firstly are available at NUTS 3 level, secondly completely cover the ESPON space and thirdly allow for comparisons across the ESPON space. We aim to consequently provide comparable and detailed regional analysis at NUTS 3 level across the ESPON space. In addition to the data sets used so far for this purpose we are especially requesting the following key data for all NUTS 3 regions of the ESPON space:

- Regional specialisation data on NUTS 3
- Real GDP change, in percent per years, 1994 to latest available year.
- Real GDP per capita change, in percent per year, 1994 to latest available year.
- CORINE land cover data 2000

Furthermore data sets on the following issues are wanted:

- Flows of people, goods, services and knowledge

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Framework for polycentricity and enlargement

Lisa Van Well and Lars Olof Persson

An enlarged Europe and extended internal market is now de facto with the accession of 10 new member states to the EU on May 1, 2004. For this fifth wave of enlargement, the process of integration of new member states into the EU has been an ongoing task for the European Union- a process of cohesion, assimilation and convergence that was begun many years prior to the accession date and will continue on for many years to come. Yet enlargement also represents one of the most important opportunities for the EU as a whole to increase international competitiveness, and through sustainable growth, become the most competitive and dynamic knowledge based economy in the world.

Effects of enlargement and integration are already being seen and these present, not unsurprisingly, a mixed bag of results: Growth rates in the enlargement area are above the EU-15 average, but real economic convergence remains limited. Economic restructuring is occurring in the enlargement area from primary sectors to the service sectors, but employment levels have fallen.

The special geographic, historical economic and political position of most of the New Member States (EU-10) and the other accession countries give a whole new meaning to considerations of polycentric spatial development. For centuries many of these countries have been part of a buffer-zone between East and West[1], and this situation will remain today. Although their importance in national and European security concerns has diminished somewhat, they still remain as an economic buffer between of the economic power of Europe and the economy in transition of Russia. Many of these states are fairly new players in the market economy and are relatively new in building up decentralized systems of governance. St. Petersburg, Moscow, Kiev and Istanbul now constitute centers of economic power at the frontiers of the European territory and are important nodes in the polycentric development of Europe.

The objective of the ESPON 1.1.3 measure is to analyze the enlargement of the EU and the wider European perspective with regards to its polycentric spatial structure. We do this by first taking a step back and examining the situation of the changing European tissue from 1995-2000 via backcasting methods to diagnose the state of spatial development in the EU as a whole and primarily in the EU-10. A second step involves ascertaining recent trends in development patterns. We also employ forward looking scenarios to examine possible futures of the stepwise spatial integration of the New Member States and candidate countries in a polycentric and balanced European space.

[1] Itotai. A., "The Easter Enlargement of the EU, in Cremona, M., 2003, The Enlargement of the European Union, Oxford University Press.

This chapter puts the work being done by the 1.1.3 team into a normative and theoretical framework. We will then revisit the key messages of our earlier interim reports, thus setting the stage for the research most currently produced.

1.1 Key normative objectives

The key objectives of balanced competitiveness, social and economic cohesion and conservation of natural and cultural heritage have taken on increased importance as normative objectives for the expanded European territory. Ambitions to reach these objectives within a reasonable time period has introduced an enormous challenge to the consorted action of both old and new member states, simply because of the large gaps in social, economic and environmental standard between old an new member states.

The ESPON 1.1.3 project will, in accordance with the *Terms of Reference*, address these fundamental objectives in our analysis of the particular effects of enlargement of the EU and beyond on the polycentric spatial tissue of the European territory. Thus the effects that the enlargement process has had, is having, and is expected to have, on the polycentric development of the territory will be normatively, if not always empirically, evaluated in light of these objectives.

The problem with empirically evaluating the effects of enlargement on polycentricity in terms of the three objectives is that competitiveness, cohesion and conservation are not codified in terms of EU policy. Spatial development policy, in which these three objectives are operative, is still the formal and legal domain of national and local governments. However, while the EU does not have full competence in the area spatial development, it has been active in producing a set of common objectives or *norms* for the area. We will address these objectives in this section, as well as in the final section, as *norms,* which describe "collective expectations for the proper behavior of actors with a given identity" (Katzenstein 1996:5). They differ from policies or regulations in that they have weak legally enforceable qualities. Rather norms prescribe or proscribe the range of acceptable actions for an actor (governmental or non-governmental) that adheres to a certain identity, in our case a European identity. As Kratochwil (1989:11) states "Norms are therefore not only "guiding devices", but also the means which allow people to pursue goals, share meanings, communicate with each other, criticize assertions, and justify actions."

With regard to European spatial development, the primary normative document is the ESDP[2]. This legally non-binding code of guidelines and actions that "ought" to be carried out has no legal backing, but assumes its power via the intensive negotiating process between governments and EU institutions that preceded the adoption of the

[2] The ESDP process has also be conceptualised as a "discourse" by Böhme (2003) or "ideology" by Hajer (1989). These conceptualisations obviously are close to seeing the ESDP process as a normative one. The focus on norms, however, in our definition, puts more emphasis on the identity factor, that is that the ESDP proscribes and prescribes the actions that should be taken for an actor with a "European" identity.

document[3]. The broad norms of the ESDP are synthesized into *economic and social cohesion, conservation of natural and cultural heritage* and *balanced and effective competition across the community territory.*

1.2 Instruments for reaching the normative objectives - the multi-level perspective

According to the ESDP, tools for achieving the triplet goals of competitiveness, cohesion and conservation include the processes of *polycentric spatial development*, *prudent management of natural and cultural heritage equal accessibility to transport communication infrastructures and knowledge*.

In terms of the research being conducted by ESPON 1.1.3, the focal instruments suggested for reaching these normative objectives in the Enlargement area in light of polycentric and cohesive development are those suggested by the Third Report on Economic and Social Cohesion (Feb. 18, 2004) *convergence, regional competitiveness and employment* and *territorial co-operation*. The challenges for designing operational policies in this direction in the case of enlargement are – i a – the current monocentric structure of most new member states and the physical, cultural, economic, infrastructural etc barriers to cooperation, particularly in national border regions in the new members states and at the new external border. The potential for increased polycentricity and constructive territorial cooperation lays in the formulation of EU, national, regional and local policy interventions that take advantage of endogenous and intrinsic opportunities in a bottom-up fashion, while still being attuned to the normative goals of cohesion, competition and conservation. Structural fund support from the European Union also tends to support projects which that are based on cooperative and bottom up approaches to increase territorial cohesion by empowering local communities, facilitating networks and increasing dialogue within and among regions (ESPON 2.2.1, SIR)

The call in much documentation of the European Union that is echoed in the Crete Guidance paper is for multi-level governance and integrated policy options on all levels, from the European to the local. For example, the Third Report on Economic and Social Cohesion (Feb. 18, 2004) insists that particularly with regard to the challenge of enlargement, "…special attention will need to be given to ensuring the maximum coherence between the Structural Funds and national policies…" (2004.xxi).). Indeed the vertical integration of policy interventions is a great challenge due to the wide variety of territorial concerns and institutional capacity in the nations and regions of the enlargement area. While ESPON 1.1.3 cannot, due to funding and time restraints, make a study of the governance processes in each

[3] See Faludi, A. (2002) "The European Spatial Development Perspective (ESDP: An Overview" in Faludi, A.
(ed) (2002) European Spatial Planning, Lincoln Institute of Land Policy. Cambridge, Massachusetts.

member state or region, we do in the final chapter on Policy Combinations[4], suggest a framework for addressing recommendations on the multi-sectoral and inter-level scale with regard to the regional typologies drafted in this report.

1.3 New direction for policy to avoid overlap, conflicts and increase synergy

Combining policy sectors and planning areas to achieve the goals of a regional development strategy is not a straightforward task; at the European level or at the regional level. Yet with the goal to produce synergies among the three aspects of sustainability, it is necessary to create novel means of at least coordinating, if not integrating, diverse policy and planning sectors such transport, competition, agriculture, environment, culture, etc. This is particularly reflected in the call for sustainable economic, social and ecological development, yet the tools to integrate these areas are still few and far between. For instance, in the quest for economic growth and the leveling of economic and social disparities in the EU 25, environmental concerns are usually rhetorically highlighted, but pushed to the back seat when in conflict with actual economic or social issues. This is a challenge for many regional and local authorities. In the same manner, social welfare concerns will also have to be horizontally integrated into policy areas if sustainable spatial development is to be just.

In many cases combination of policy and planning areas, such as the integration of sustainability issues into other policy areas is an exercise in negotiating sectoral interests to achieve coordination. This process entails initially creating a culture and a will for integrated policy making and subsequently the formal and informal administrative channels for coordination in a segmented governance system. Needed elements of a regional programme that integrates competition, cohesiveness and conservation concerns include pronounced and clear goals, strong leadership, legitimatization or sectoral areas and partnerships with all stakeholders.[5] Regions in Western Europe, and particularly in N-W Europe are perhaps advantageously placed to engage in this activity, as they are often the more operationalised links between national policies and local implementation. However regions in the EU-10 are still to find their places as administrative entities and thus require greater interventions in building institutional capacity and increasing stakeholder participation.

The normative guidance provided by the ESDP has also been complemented by various European political processes, one of the most important being the Lisbon/Gothenburg process as an intergovernmental forum for the goals and principles of the EU regarding sustainable growth. The primary aim of the Lisbon

[4] Policy ”Combinations” are groupings of coordinated sectoral and multi-level policy interventions which, rather than addressing recommendations to singular, sectors (like transport or environment) attempt to address the range of normative goals of competition, cohesion and conservation in an integrated, non-conflicting manner.

[5] Bredda Perspektiven!: Miljöintegration i tillväxtarbetet. Naturvårdsverket, Rapport 5136, 2001.

Council is that "The EU should become the most competitive and dynamic knowledge based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion". The achievement of making Europe the most dynamic area of the world by 2010 will put additional emphasis on the potential of regions. Again, the 10 new member states altogether have a great potential for contributing to this. The Gothenburg Council of 2001 added the sustainability aspect to these goals and reiterated the need of including ecological sustainability into any equation of regional development. In the enlargement area, this is a major challenge, given the enormous need for investments in infrastructure and management know how in environmental protection and restoring.

Care must obviously be taken in any policy intervention for competitiveness or growth, that growth is sustained in a polycentric manner that will hopefully increase economic and social cohesion at all levels. Thus the goal is to fashion policies in which the normative objections of the ESDP reinforce, or at least do not conflict, with one another-preferably synergistic policies. Synergy is an effect produced that is greater that the sum of the efforts put into the production of the effect. Defined[6] as the added value resulting from inter-level linkages of policy options, synergies can be sought to facilitate three functions – reducing informational, knowledge-attaining and implementation costs, enabling cost-effective administrative routines, and avoiding cross-sectoral contradictions in terms of impacts.

1.4 Research questions

Are combined policies aimed at polycentric spatial development indicative of synergistic effects? If so how is this achieved and where are measures most needed? How will polycentricity in the Enlargement area fulfil the normative objectives of competitiveness, cohesion and conservation? These are some of the normative questions addressed explicitly in this TIR, most specifically in Chapter 2 on Polycentricity, but also implicitly throughout the other chapters.

Relevant research questions:

- Which are the current process of polycentric development in the enlargement area?
- What is the existing diagnosis of the spatial tissue in the EU-25 with special emphasis on the EU-10?
- Where are the particular areas at risk in the Enlargement area with regard to sectoral specialization?

[6] UNDP on the other hand defines *synergy* as the "culmination of a process in which complementarities …are identified and used to further implementation while overlaps are eliminated (or at least reduced)". (UNDP, 1997 :p 3).

- What are the special needs of border regions in the enlargement area with regards to barriers inhibiting flows?
- What are the possible futures of the enlarged European Union with regard to accessibility to promote polycentricity and performance of regions?
- In response to processes induced by EU enlargement, what policy combinations at all levels are (or could be) efficient in order to enhance competitiveness in all parts of the EU?

Spatial consequences of the enlargement are discernable at all geographical levels. The theoretical basis for explaining and predicting spatial consequences at each level of the processes are largely found in economic geography (for instance Krugman 2003, Porter 2004, cultural geography (for instance Bruter 2004) integration theory (for instance Wiener and Diez 2004), but also in political science and public administration; e g theories on multi level governance and European integration (for instance Hooge and Marks 2001, Eser and Konstadakopulos 2001, Kohler-Koch 1999 or Bach 1998).

1.5 Overview of the TIR:

Chapter 2: In the 1.1.3 SIR our focus on ***polycentricity*** was quite conceptual and took up some of the "multiple meanings" of the concept and the need to address polycentricity at multiple scales. A method to "measure" polycentricity in cooperation with ESPON 1.1.1 was sketched. In this report the method is developed much more rigorously and applied to functional urban regions (FUAs) in the accession countries to distinguish to what extent polycentric development is actually occurring. More importantly this chapter also evaluates the effects of polycentric development in accordance with the three normative objectives of the ESDP, Competition, Cohesion and Conservation (Sustainability) and highlights the goal conflicts inherent in polycentric policies for the accession countries. Chapter 2 also arrives at some conclusions and hypothesis concerning cities in the enlargement area with the potential to be nodes of development competing with the Pentagon, the potential transnational urban networks and potential transnational regions of integration per macro-region in the enlargement area, and finally how transnational cooperation and the impact of the new TEN-T may effect polycentric development of the enlargement space.

Chapter 3 gives a detailed spatial ***diagnosis of enlargement.*** We first take a step back and set the stage for enlargement by making a diagnosis of the European (and particularly the Enlargement) area to determine the spatial trends. This includes visualizing economic and population redistribution before enlargement at the macro-level, examining convergence/divergence meso trends in the EU-10, and looking at

the sector specific dynamics of FDI and the banking sector. At the end of this chapter ponder the question significance of geographic proximity of regions by rigourously analysing the degree of spatial association of regions in the ESPON space.

Chapter 4 focuses on developing ***draft typologies*** of the various needs of regions of the Enlargement area. We measure the regional specialisation and geographic concentration of sector employment in the EU-12 and present a typology that describes changes occurring *within* regions and how they relate to regional performance and *a* typology that describes geographic concentration as changes occurring *between* regions and at the wider geographic scales in terms of trends towards concentration or dispersion. In order to target the particularly vulnerable regions of the ESPON space we focus on those characteristics allowing for complete quantitative observation at NUTS 3 level and this involves a range of indicators. We then identify "Fringe", "Shrinking", "Rustic" and "Rust belt" communities.

The special needs of border regions are highlighted with typologies based on the particular barriers to flows of people, goods, services and knowledge. This sectionbuilds on the work done for the SIR by analyzing in greater detail the different components of border characteristics in the border regions of the EU enlargement area. We then analyse the geographic type of borders, ethnic-historical types of borders, density of border crossings, economic disparities and the membership in Euroregions and transnational Working Communities. These are the basic components for elaborating first draft typologies for "border typology for integration potential" trying to identify on NUTS III level forerunners, hardworkers, candidates of integration and handicapped for integration. As this chapter is based on the pre-conditions for *potential flows* of goods, services, people and knowledge, which are difficult to quantitatively measure due to lack of data, the chapter concludes with a sketch of border region case studies which will be addressed in the Final Report.

Chapter 5 takes a forward looking approach and presents the first results of the two ***Scenario studies*** being developed for ESPON 1.1.3. These scenarios use two different but complementary forecasting models of regional socio-economic development- the RESSET model used in Scenario Study 1 and the SASI model for depicting the impacts of European transport policies in Scenario Study 2. Scenario Study 1 sketches the RESSET planning model which enables any casual user with a view about the future urban and regional development of the ESPON space to engage in information speculation: to explore the scenario space. RESSET simulates change in the European space at three levels: first at the entire EU29 level (EU15+CH+NO+AC12) which involves a demo-economic forecasting model of the 29 countries based on extrapolation of population and employment under various plausible scenarios about aggregate growth rates – fertility and mortality, net migration and economic development. Scenario Study 2 is forecasts the socio-economic development of the regions in the accession countries after their entry into the European Union, taking account of the expected reduction of border barriers, such as waiting times and customs procedures and of the different scenarios of implementation of the TEN-T and TINA projects.

In **Chapter 6** we take up ***policy recommendations*** for enlargement of the European Union with regard to its polycentric spatial development. First we conceptualise some of the problems associated with "the art and science" of making policy recommendations for such a diverse territory and with regard to the normative objectives of the ESDP. Next we suggest two different rationales for making policy recommendations based on two very different logics of political behaviour and suggest a general framework of recommendations for each of these rationales. We then propose the case for making policy combinations of recommendations to reflect the need for integrated multi-level and inter-sectoral policy interventions that are demanded by polycentrism. Finally we discuss some preliminary final concrete recommendations from the results of this Report.

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2 Polycentricity and Enlargement

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.

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 its project title suggests, polycentricity is also of great importance for ESPON 1.1.3. In contrast to ESPON 1.1.1, here the focus is on polycentricity in the new member states of the European Union.

2.1 Discussing Polycentricity in the Context of Enlargement

Minas Angelidis

2.1.1 Some Analysis priorities deriving from the ESDP/ ESPON Policy

Polycentrism is both an analytical concept and a policy option[1]. Thus, we need to give priority to the study of those elements of the analysis of the role of the cities (and urban systems) in spatial development. This aid in our discussion , and help to specify this policy option. However, this does not mean that we have to distort our analysis or to "justify" this policy option. Aside from other things, "polycentrism" as a policy option includes some contradictory elements, as we will see later in this chapter.

Polycentrism as a policy option is interpreted and specified differently in different policy contexts or scientific contexts. Its interpretations both in the ESDP and in the ESPON are not completely clear. ESPON project reports, guidance papers as well as other materials tried to produce a common understanding / terminology of the polycentrism policy option, but some elements of this policy option continue to be interpreted differently by the different ESPON materials. Here, we use definitions and terms selected mainly from the Matera Guidance Paper and the ESPON 1.1.1 reports.

The ESDP as well as ESPON put a widely accepted political objective: to counterbalance the "over-development" of some cities and regions at all territorial levels of the EU space.

Polycentrism is, firstly, needed to counterbalance the supremacy of the "Pentagon" (and the powerful cities and urban networks inside the "Pentagon") by supporting the development of major cities as well as urban networks located outside the "Pentagon".

In a national context, balanced spatial development (at national, regional and local levels) is based on the balanced development of urban networks shaped by regional capitals, other medium-sized cities as well as small cities.

[1] We could use the term "polycentricity" for the analytical concept and the term "polycentrism' for the policy option.

These policy options should constitute assumptions (hypotheses) to be tested, validated or invalidated, changed or specified by the analysis of cities and urban networks in the frame of the ESPON projects.

More specifically:

- At European / transnational (macro) level, we should examine: Which are the cities and urban networks, outside the "Pentagon", which could potentially compete successfully with the important cities and urban networks of the "Pentagon" as well as help their wider regions to compete successfully with the "Pentagon" itself? Which are the factors as well as other conditions e.g. complementarities that gave them this potentiality? Which of these factors and conditions should be improved and which should be eventually added in order for these cities / urban networks (and their wider regions) to limit their distance to the "Pentagon"?
- At national (meso) level, we should examine whether the dominance of the strongest city could (or should) be counterbalanced by the development of other cities and urban networks.
- At regional / local (micro) level, requests for the analysis and relevant assumptions (hypotheses) are analogue to the above.

In our opinion, the *"three-level approach" section of the Matera Guidance Paper* gives useful guidelines concerning the main requests from the polycentricity analysis in order for this analysis to be of help to the specification / clarification of the polycentrism specific policy options. It does not only discuss the necessity of the "three-level approach", but also priorities for the polycentricity analysis. Thus, we think it is helpful to use the relevant text as an important reference (see Annex 2.1).

Contradictions between "polycentrism" policy option at different spatial levels as well as subsidiarity principle make the three-level approach necessary.

It is very probable that the development of the rival to the "Pentagon" cities and urban networks will be made at the expense of the balanced development of the national urban systems (in case no other measures will be implemented). More precisely, in case we strengthen the development of the capital city of a country - or of some powerful cities of the country - we will improve the competitiveness of the capital city and of the national urban network vis-à-vis the "Pentagon", although we may at the same time reduce the balance of the national urban system.

The same could be done at national level. In case we strengthen some regional capitals of the country in order to counterbalance the supremacy of the capital city, this may reduce the (relative) power of the small cities, thus the balance of the national urban system may be reduced. This is particularly a well known dilemma for many of the new member states.

To be realistic, the confrontation of this contradiction is firstly a political question. Some national societies (and general political projects) may prefer to accept to increase the

imbalance of their national urban system so as to raise the competitiveness of their national urban system at European level in a short term and eventually prioritise the balance of their national urban system later on. Some other may prefer to do the opposite.

Evidently, the confrontation of this contradiction has a "technical" aspect too. It is very probable that in case a country strengthens complementarities between the nodes of his national urban network (without implementing other measures), the country will have some benefits as far the territorial cohesion is concerned. Although, this issue remains not clear enough, so we need to investigate it more.

Contradictions between "polycentrism" policy options at different spatial levels make the "three-level approach" necessary. Another reason, although, advocates for that. The analysis in these three spatial levels can support policy options which will be implemented, based on the principle of subsidiarity, that is to say by different level authorities. EU authorities cannot directly implement polycentrism policies for each EU country and vice versa. Conflicts between "EU level" polycentrism policy options and "national level" polycentrism policy options will be resolved politically, but "technical" analysis should clarify the technical aspects of these conflicts.

At this point we should remark that there are not in the EU territory authorities at transnational level so as to implement necessary polycentrism policy options at this level. EU spatial implementation policy favours transnational cooperation in spatial development via INTERREG etc. The Third Cohesion Report stresses the need to further institutionalise the concerted action at this level.

Analysis priorities

Summarising the above, we could conclude that the analyses of the ESPON projects concerning polycentric development should put attention by priority:

- To the factors which accelerate the development of the cities themselves and the "multiplier effect" to wider regions (so as to be more competitive at different spatial levels)
- To the complementary relationships between cities which form (or could potentially form) urban networks, which accelerate the development of the urban networks themselves and the "multiplier effect" to wider regions (so as to be more competitive etc).
- To the "three-level approach", pointing at the appropriateness of policy combinations, addressing all levels.

Aspects of the polycentricity analysis that are not sufficiently examined by ESPON 1.1.1

In our opinion, ESPON 1.1.1[2] studied in depth factors and indicators concerning the cities (FUAs) as single entities (which could counterbalance strong cities inside the 'Pentagon" as well as the "Pentagon" itself, strong cities at national level and so on), but didn't investigate as much as needed the complementarity relationships between cities, which already form or could possibly form urban networks ("potential urban networks") capable to accelerate the development of wider regions (at transnational level[3], as well as at national and regional levels).

Also, ESPON 1.1.1 has not investigated the aspect of the polycentrism related to the equitable distribution of the "services to the population" – as this was not included in its terms of reference. In ESPON 1.1.3 we address this issue particularly as we analyse service provision problems in depopulating regions in the enlargement area and as we stress the need to strengthen the functions for second rank regional service centres (cf Chapter 6)

Furthermore, analyses concerning urban networks as single entities have been done mainly in the basis of the size of cities as well as factors / indicators concerning each city (FUA). In our opinion, these analyses should be complemented taking into account the effects of transport / communication infrastructures (concerning complementarity / networking between cities) existing or included in the new TEN-T. In ESPON 1.1.3 we model alternative scenarios for transport infrastructure within and between EU15 and EU15 (cf Chapter 5),

Also, the distinction between different spatial levels (three spatial levels, as Matera Guidance Paper suggests) need to be more rigorously investigated. In particular it is of great importance to go into more depth to analyse transnational cooperation between cities and urban networks, taking into account the attention attributed to this cooperation by the Third Cohesion Report. As a starting point ESPON 1.1.3 explores emerging transnational networks in the new member states (cf Chapter 2.3)

2.1.2 The specific Form of Polycentricity in the Context of Enlargement

The major polycentrism challenge in EU is to reinforce the development of major urban regions and Transnational Regions of Integration (TRI) outside the "Pentagon" so that they become capable of competing with this 'European core area". Actually, major urban regions of the enlargement area are weaker than their EU15 rivals and the level of integration of the Transnational Regions (TR) of the enlargement area is lower than that of the TRs of the EU15. So, while the polycentrism policy should cover the entire EU territory, a much stronger effort – and funding - should be paid in the case of the enlargement area.

The nature of the urban regions' problems also differs in the enlargement area compared to the EU-15. "Almost every Central and Eastern European country is suffering from regions dependent on large-scale industries (Czech Republic, Hungary; some Northwest regions, Poland: Upper-Silesia, selective spots of Romania, Slovakia: Western regions etc.). Though

[2] Our purpose is by no means to evaluate the work done by ESPON 1.1.1. We only attempt to precise which additional analyses we need so as to better support polycentrism policy recommendations.
[3] They are called in ESPON: Transnational Regions of Integration – TIR.

the processes of industrial conversion are at an advanced stage in some places, others still require specific assistance for the successful restructuring of their economic structures, for solving environmental damage, replacing worn out infrastructure and helping the labour force to attain new qualifications through taking up higher education opportunities. As the old industrial regions are likely to remain one of the core economic zones of the candidate countries, the Structural Funds should pay special attention to their bottlenecks and concentrate public funding on overcoming existing challenges. Growth potentials and the challenges of old industrial regions are specifically identified in the central trans-national region of the accession countries. Capital cities dominate the economic geography here and the endowment of the potentials in each of the countries under consideration (with the exception of Poland), but their integration function is often insufficient. *Differences in the performance of urban areas, especially as regards the difference between urban areas in the EU15, and in the new countries, suggests that a common policy approach for strengthening urban areas in difficulty across the whole of the EU will not be appropriate"* (ESPON 3.1 TIR 2003).

In addition, transport infrastructures necessary for the networking between urban nodes are weaker in the case of the new countries.

Finally, spatial governance capacity is relatively limited here. Thus, improving spatial integration at transnational level that means supporting the coordination of developments, policy and planning activities of the neighbouring countries is more difficult in the enlargement area.

The specific form of polycentricity in the enlargement area is investigated more in depth in the following chapters (2-5) so as to make appropriate policy recommendations in Chapter 6 of this report. This will be further explored in the Final Report of ESPON 1.1.3.

2.2 How to measure Polycentricity in the Enlarged Europe

Michael Wegener

This section is a development of a methodology initially used in ESPON 1.1.1 to measure the degree of polycentricity of the urban systems of the European urban system at large, of individual countries and of regions within countries. In ESPON 1.1.3 the method is used to measure the current degree of polycentricity and to forecast the impacts of European transport policies on polycentricity in the new member states and to evaluate the results with respect to the European policy goals competitiveness, cohesion and sustainability.

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. 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.

2.2.1 Three Dimensions of Polycentricity

The developed approach measures polycentricity by identifying three dimensions of polycentricity: the *size* or importance of cities (population, economic activity), their *distribution in space* or *location* and the *spatial interactions* or *connections* between them:

Size Index

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. Moreover, a flat rank-size distribution is more polycentric than a steep one. Finally, a polycentric urban system should not be dominated by one large city.

To operationalise this, two sub-indicators were defined: (a) the slope of the regression line of the rank-size distribution of population and (b) the degree by which the size of the largest city deviates from that regression line. When calculating the regression line, all but the largest city are considered.

Rank-size distributions of population of cities in the accession countries differ significantly. Figure 2-1 shows the rank-size distribution of functional urban regions in selected accession countries. It can be seen that Hungary and Poland have relatively polycentric urban systems, but that in Hungary Budapest as the former capital of a much larger territory is very dominant. Bulgaria has a large number of provincial cities, yet Sofia and Plodiv are too large for the urban system of the country. In the Czech Republic the rank-size distribution is flatter at the lower levels of the urban hierarchy but distorted in the top range of cities, although Prague is about the right size. Smaller countries, such as Estonia and Slovenia, tend to have steeper rank-size distributions (which is not visible in the diagrams due to different horizontal scales).

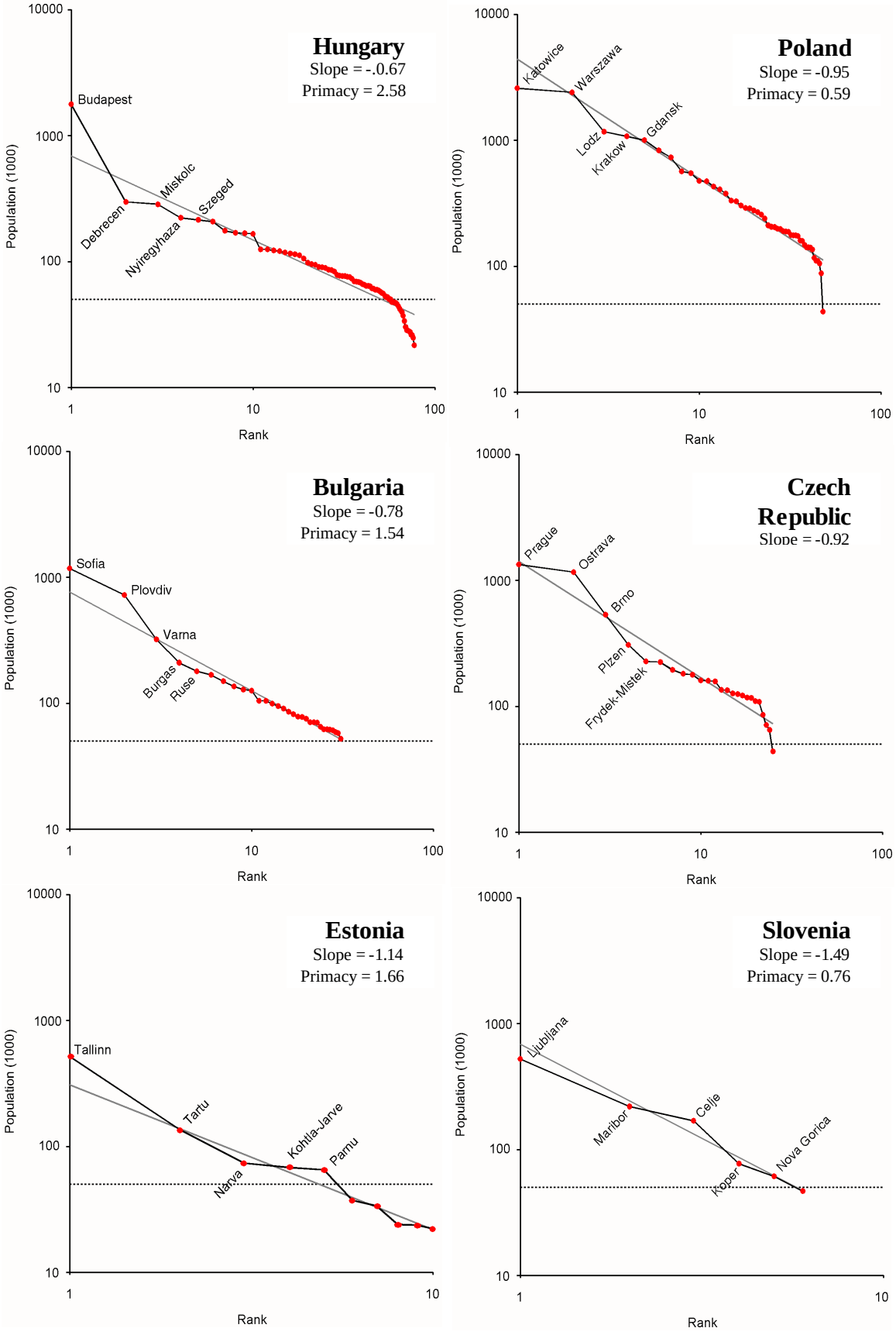


Figure 2-1: Rank-size distributions of population of FUAs in selected accession Countries

An alternative is to perform the same analysis not for population but for GDP. As with the rank-size distribution of population, two sub-indicators were defined: (c) the slope of the regression line of the rank-size distribution of GDP and (d) the degree by which the GDP of the city with the largest GDP deviates from that regression line. When calculating the regression line, all but the city with the largest GDP are considered. Here, the primacy rate is interpreted in terms of economic dominance: a primacy rate above one indicates that the primate city is "too rich" for the urban system of the country.

Figure 2-2 shows rank-size distributions of GDP of functional urban regions in selected accession countries. Again Hungary stands out by its dominant capital city, which is too large in terms of population but also too dominant economically from the point of view of a balanced polycentric urban system. A similar picture emerges for Romania, but with a much lower primacy rate of Bucharest. The distribution of economic wealth over cities in Slovakia is very balanced. In the Czech Republic, Prague is economically very dominant, although not in terms of population (see Figure 2-2). Lithuania and Latvia differ greatly with respect to their capital cities: Whereas Vilnius under-performs compared with its position in the urban hierarchy, Riga overshadows all other cities in Latvia.

Location Index

The second prerequisite of a polycentric urban system is that its centres are equally spaced from one another – this prerequisite is derived from the optimal size of the service 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 over space. One possible approach is to subdivide the territory of each country into service areas such that each point in the territory is allocated to the nearest centre – such areas are called Thiessen polygons. Thiessen polygons can be constructed by dividing the territory into raster cells of equal size and to associate each cell with the nearest urban centre. In this way the area served by each centre can be measured.

In the present analysis airline distance was used to allocate raster cells to centres. As measure of inequality of the size of service areas (e) the Gini coefficient of inequality was used. The Gini coefficient measures the degree of inequality of a distribution between zero and one (or zero and 100), where zero indicates perfect equality and one (or 100) maximum polarisation.

Figure 2-3 shows the subdivision of the accession countries into service areas of FUAs. The inequality is largest in the Czech Republic and in Hungary. In both countries cities are highly clustered, in the Czech Republic in the western part of the country, in Hungary around Budapest. The Baltic states, Poland and Slovenia have the most balanced territorial structures.

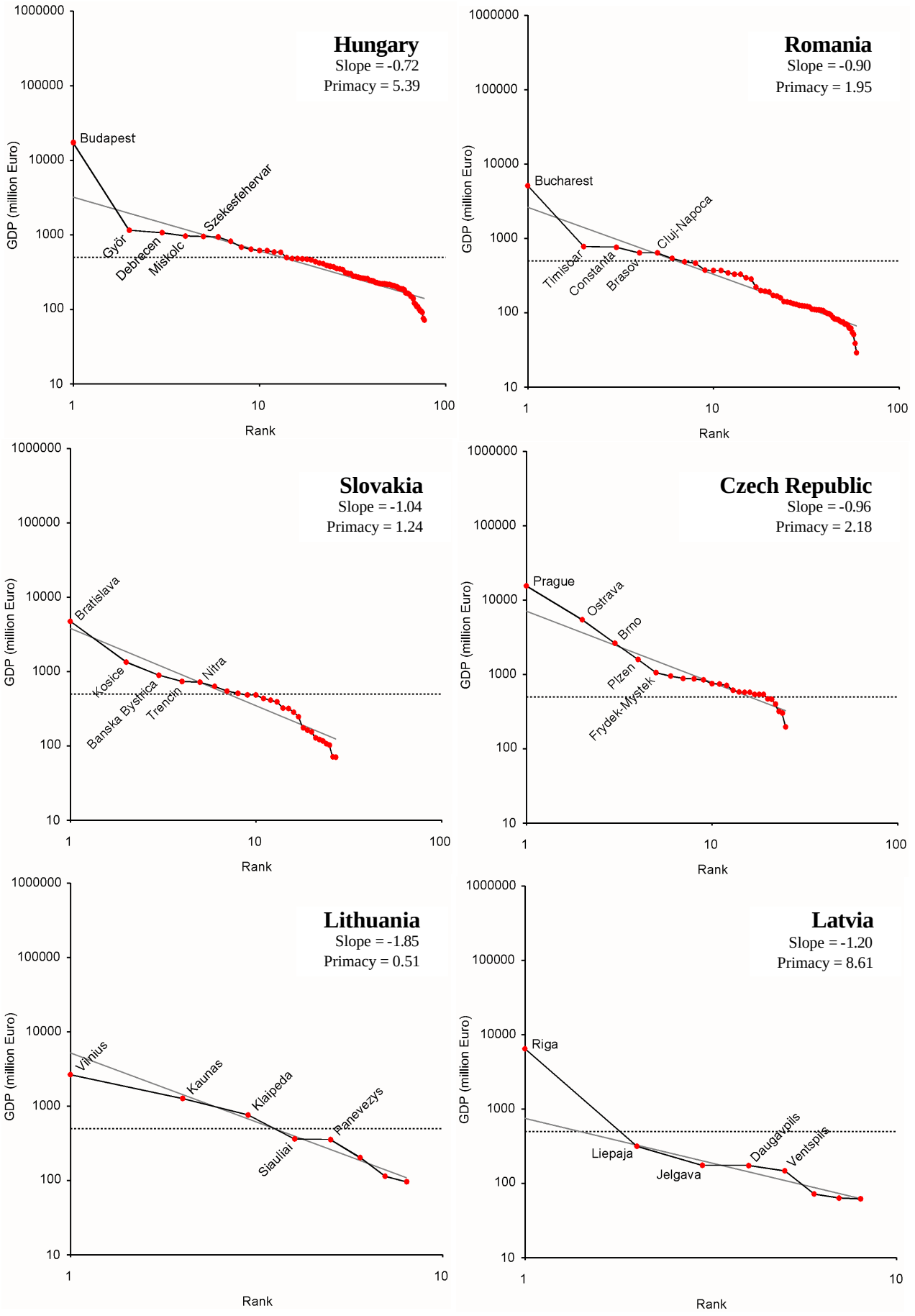


Figure 2-2: Rank-size distributions of GDP of FUAs in selected accession countries

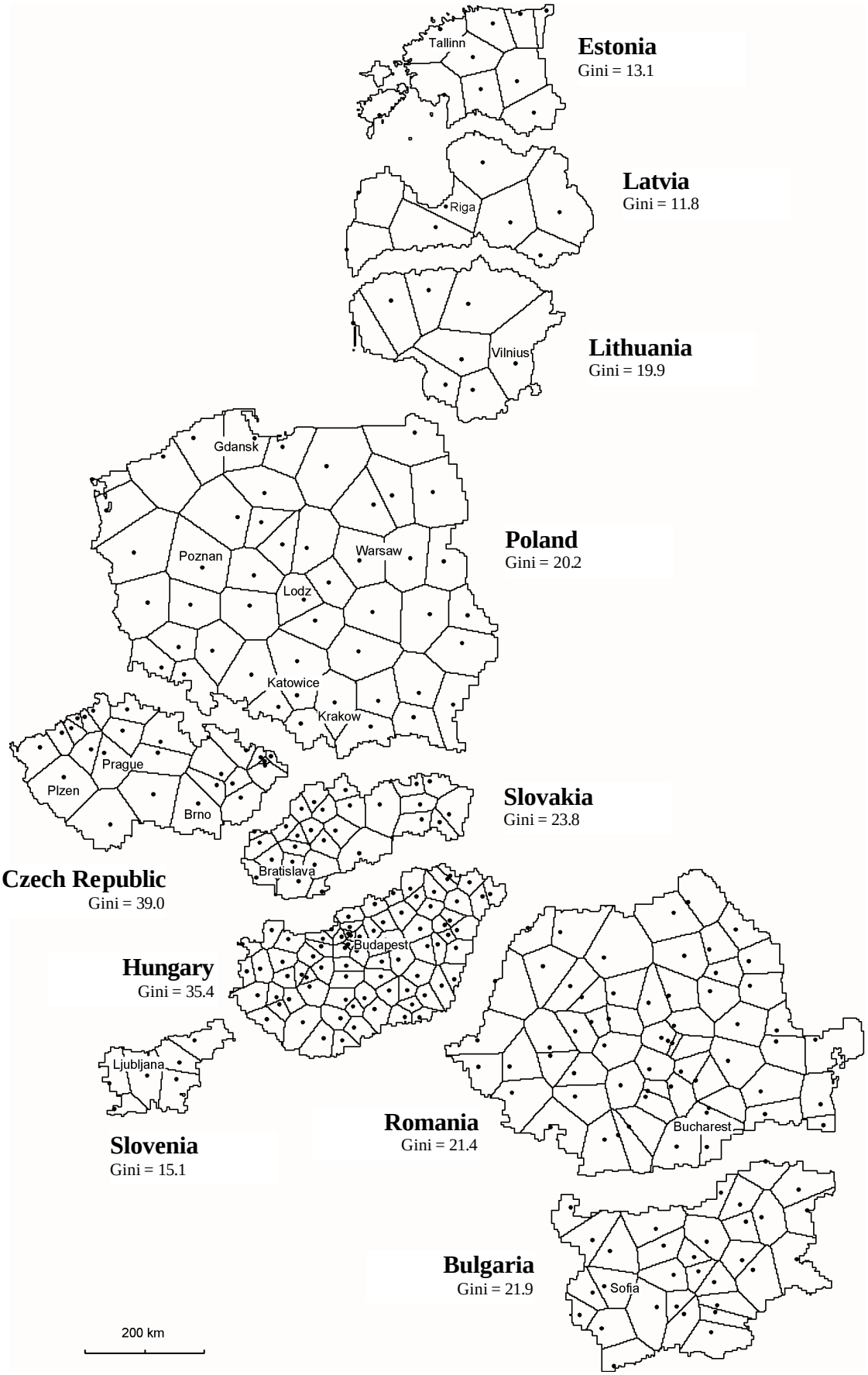


Figure 2-3: Service areas of FUAs in accession countries

Connectivity Index

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, must be 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 over the territory.

There are principally two ways to measure connectivity. One is to measure actual interactions. Ideally, the analysis would reveal functional relationships between cities of equal size or rank and between cities of different size or rank in the urban hierarchy. Appropriate indicators of such interactions would be flows of goods or services, travel flows or immaterial kinds of interactions, such as 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. An urban system with good connections between lower-level centres is more polycentric than one with mainly radial connections to the dominant capital. In polycentric urban systems also lower-level centres have good accessibility.

For measuring interaction potential, here the multimodal accessibility of FUAs calculated in conjunction with ESPON 1.1.1 was used. Two sub-indicators were defined: (f) the slope of the regression line between population and accessibility of FUAs and (g) the Gini coefficient of accessibility of FUAs. The two sub-indicators have similar meaning: the flatter the regression line, the more accessible are lower-level centres compared to the primate city, and the lower the Gini coefficient, the less polarised is the distribution of accessibility.

Figure 2-4 shows the correlation between population size and accessibility of FUAs in selected accession countries. In Poland, Romania and the Czech Republic the regression line is rather flat (because of the logarithmic representation of population it appears as a curve), which means that there is only a relatively small difference between the accessibility of the capital city and the rest of the urban system. This is different in Lithuania and Slovakia, where the capital city is much better linked to international transport networks than the other cities.

Summary of sub-indicators

The results of the analysis of polycentricity of the accession countries are summarised in Table 2-1. Malta was excluded because it has only one FUA. Cyprus was included, but because it is presently a divided country, the results have to be used with caution. The columns of the table contain the sub-indicators of polycentricity (a) to (g) defined above.

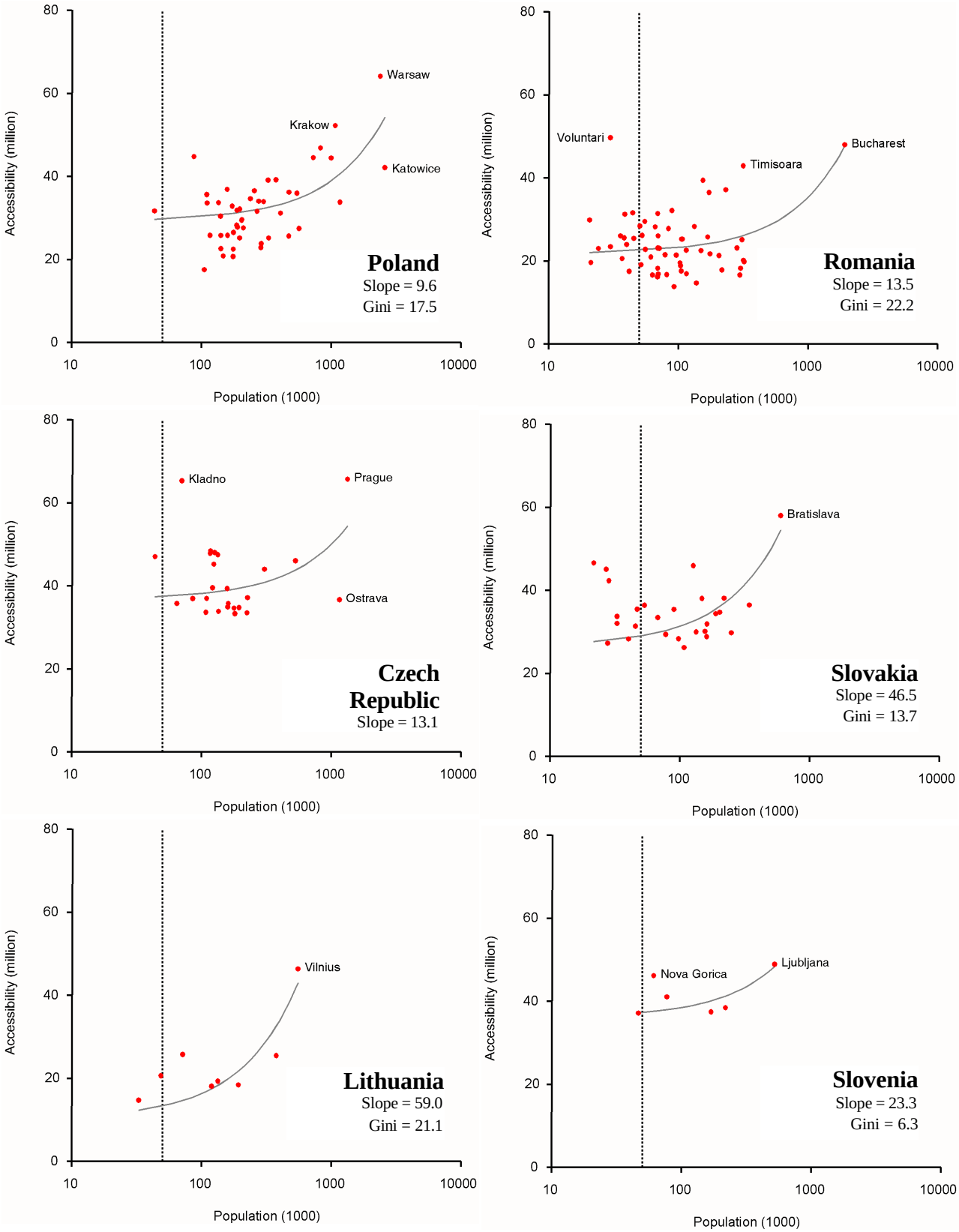


Figure 2-4: Population and accessibility of FUAs in selected accession countries

Table 2-1: Polycentricity sub-indicators of accession countries

Country	No. of FUAs	Rank-size distribution of population		Rank-size distribution of GDP		Size of service areas	Population and accessibility	
		Slope (a)	Primacy (b)	Slope (c)	Primacy (d)	Gini (e)	Slope (f)	Gini (g)
Bulgaria	31	-0.78	1.54	-0.90	2.31	21.9	14.8	18.8
Cyprus	4	-1.78	0.46	-1.79	0.46	9.7	0.9	5.2
Czech Republic	25	-0.92	0.94	-0.96	2.18	39.0	13.1	13.9
Estonia	10	-1.14	1.66	-1.09	4.16	13.1	50.7	19.9
Hungary	77	-0.67	2.58	-0.72	5.39	35.4	14.8	19.9
Lithuania	8	-1.64	0.44	-1.86	0.51	19.9	59.0	21.1
Latvia	8	-1.02	3.81	-1.20	8.61	11.8	23.3	16.0
Poland	48	0.95	0.59	-1.23	0.83	20.2	9.6	17.5
Romania	59	-0.85	1.47	-0.90	1.95	21.4	13.5	22.2
Slovenia	6	-1.49	0.76	-1.35	1.30	15.1	23.3	6.3
Slovakia	27	-1.04	0.54	-1.04	1.24	23.8	46.5	13.7

2.2.2 Evaluation of polycentricity

With the three component polycentricity indices, the Size Index, the Location Index and the Connectivity Index, a comprehensive Index of Polycentricity can be constructed.

For each sub-indicator a z-shaped value function was defined by specifying at which indicator value polycentricity is zero and at which it is one hundred. Within this range linear interpolation was performed; outside the range polycentricity is zero or one hundred, respectively.

Table 2-2 shows the threshold values defined for each of the seven sub-indicators:

Table 2-2: Value functions of polycentricity sub-indicators

	Rank-size distribution of population		Rank-size distribution of GDP		Size of service areas	Population and accessibility	
	Slope (a)	Primacy (b)	Slope (c)	Primacy (d)	Gini (e)	Slope (f)	Gini (g)
Indicator value at which polycentricity is 0	–1.75	7.5	–1.75	10	70	75	25
Indicator value at which polycentricity is 100	–0.5	0	–0.5	0	10	0	0

Table 2-3 shows the weights for the composition of the Polycentricity Index from the three component indices. Additive aggregation was used at the lower levels, whereas the three component indices were aggregated to the Polycentricity Index multiplicatively.

Table 2-3: Composition of the Polycentricity Index

Index	Indicator	Weights	Weights
Size	Slope of regression line of population Primacy rate of population Slope of regression line of GDP Primacy rate of GDP	10% 40% 10% 40%	33%
Location	Gini coefficient of service areas	100%	33%
Connectivity	Slope of regression line of accessibility Gini coefficient of accessibility	50% 50%	33%

Table 2-4 shows the results of the evaluation for the three component indices and the Index of Polycentricity for the accession countries. The last two rows of the table show the aggregate scores of the accession countries and, for comparison, the old member states of the European Union.

Table 2-4: Component indices and Polycentricity Index of accession countries

Country	No. of FUAs	Size Index	Location Index	Connectivity Index	Polycentricity Index
Bulgaria	31	77.1	80.2	52.6	68.5
Cyprus	4	75.7	100.0	89.1	87.3
Czech Republic	25	79.2	51.7	63.5	63.6
Estonia	10	64.7	94.8	26.4	54.3
Hungary	77	61.6	57.7	50.4	56.1
Lithuania	8	76.5	83.5	18.5	48.9
Latvia	8	35.5	97.0	52.4	56.3
Poland	48	84.1	83.1	58.7	74.0
Romania	59	78.3	80.9	46.6	66.3
Slovenia	6	76.0	91.6	72.0	79.1
Slovakia	27	83.5	77.0	41.6	64.2
AC12 average	304	77.5	77.1	52.7	67.1
EU15 average	1,200	77.7	57.2	68.1	65.9

Table 2-4 shows that the new member states on average have more polycentric urban systems than the old member states. This is mainly because their cities are more evenly distributed over space. With respect to connectivity, however, the accession countries are on average more polarised. Except for the special case of Cyprus, the most polycentric accession countries are Poland and Slovenia. Poland scores high in the Size Index and the Location Index but is weak in the Connectivity Index because all transport lines are oriented towards Warsaw. Slovenia has high scores in all three polycentricity dimensions. The Baltic states and Hungary are the least polycentric accession countries. Estonia and Lithuania suffer from the poor accessibility of their peripheral areas, Latvia from the dominance of Riga, and Hungary is weak in all three dimensions.

Figure 2-5 shows the spatial distribution of the four indices of polycentricity in the accession countries.

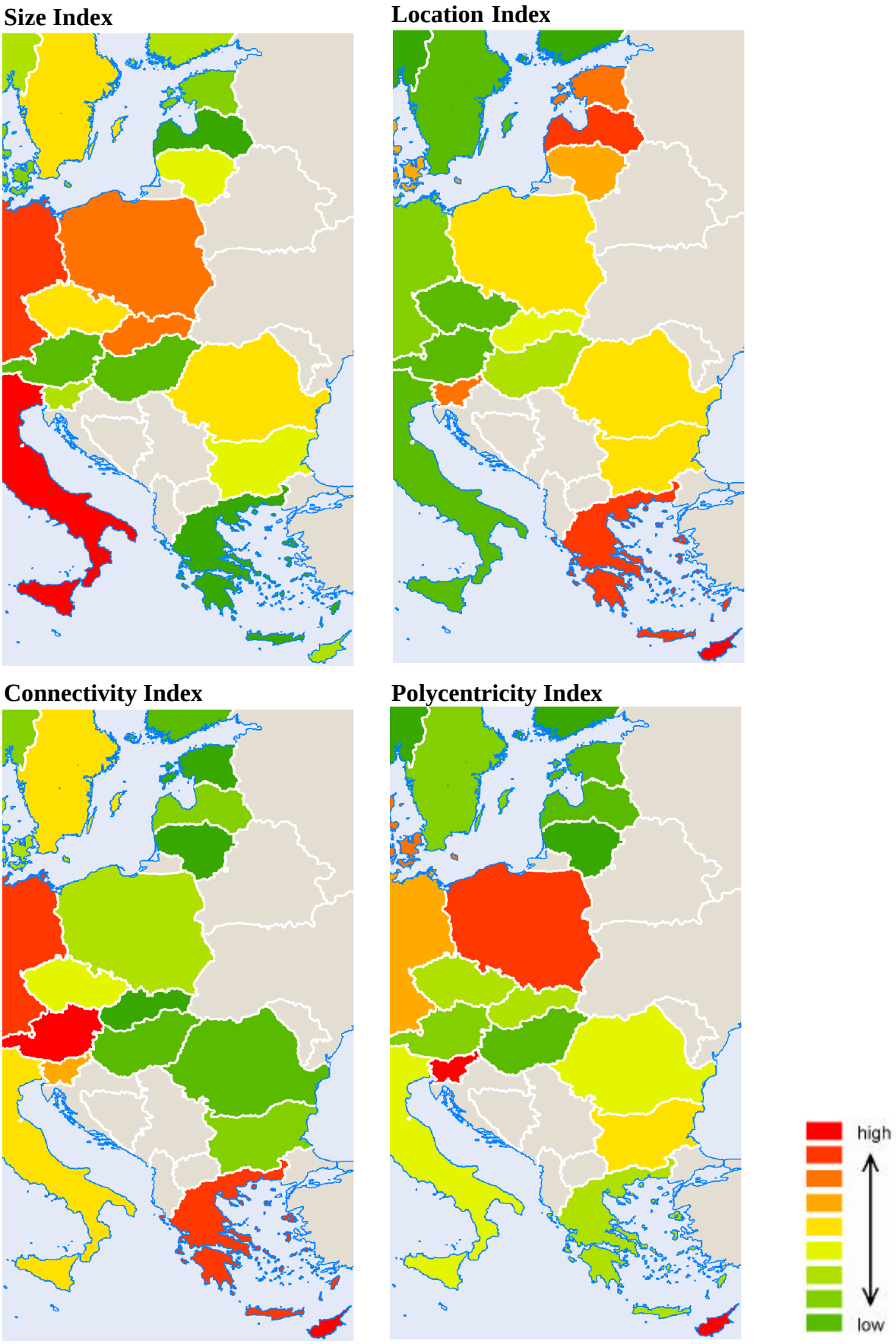


Figure 2-5: Component indices and Polycentricity Index in the accession countries

2.2.3 Policy relevance of polycentricity

In a further step it is asked whether polycentricity is good for the achievement of the three major policy goals of the European Union economic competitiveness, territorial cohesion and environmental sustainability. This is done by correlating the Polycentricity Index with indicators representing the achievement of these three goals.

Figure 2-6 shows the correlation of the Polycentricity Index with GDP per capita, equity in GDP per capita and energy consumption of transport per unit of GDP, respectively for the accession countries compared with the old member states of the European Union.

The top diagram in Figure 2-6 confirms the hypothesis that countries with a more polycentric spatial structure are economically more successful. However, this relationship is stronger in the old member states than in the accession countries. Moreover, the wide gap in GDP per capita between the old and new member states of the European Union is much more significant than the differences related to polycentricity.

The situation is more complex with respect to equity. The centre diagram in Figure 2-6 shows the correlation between the Polycentricity Index and a measure of territorial cohesion, the Gini coefficient of GDP per capita of NUTS-3 regions in each country. In the accession countries the correlation between polycentricity and equity is almost zero, i.e. polycentricity does not contribute to spatial cohesion. However, in the old member states there is an even negative correlation between polycentricity and spatial equity; i.e. more polycentric countries tend to have larger differences in income between central and peripheral regions.

The bottom diagram in Figure 2-6 shows a similar analysis for environmental sustainability. Here total energy consumption for transport (in oil equivalent) was taken as indicator of environmental sustainability. In order to neutralise the effect of income differences between countries, energy consumption per unit of GDP was used. With this indicator, there is a clear correlation between polycentricity and energy consumption: more polycentric countries use less energy for transport per unit of GDP than monocentric countries, and this holds for both old and new member states. Again the correlation is stronger in the old member states than in the accession countries.

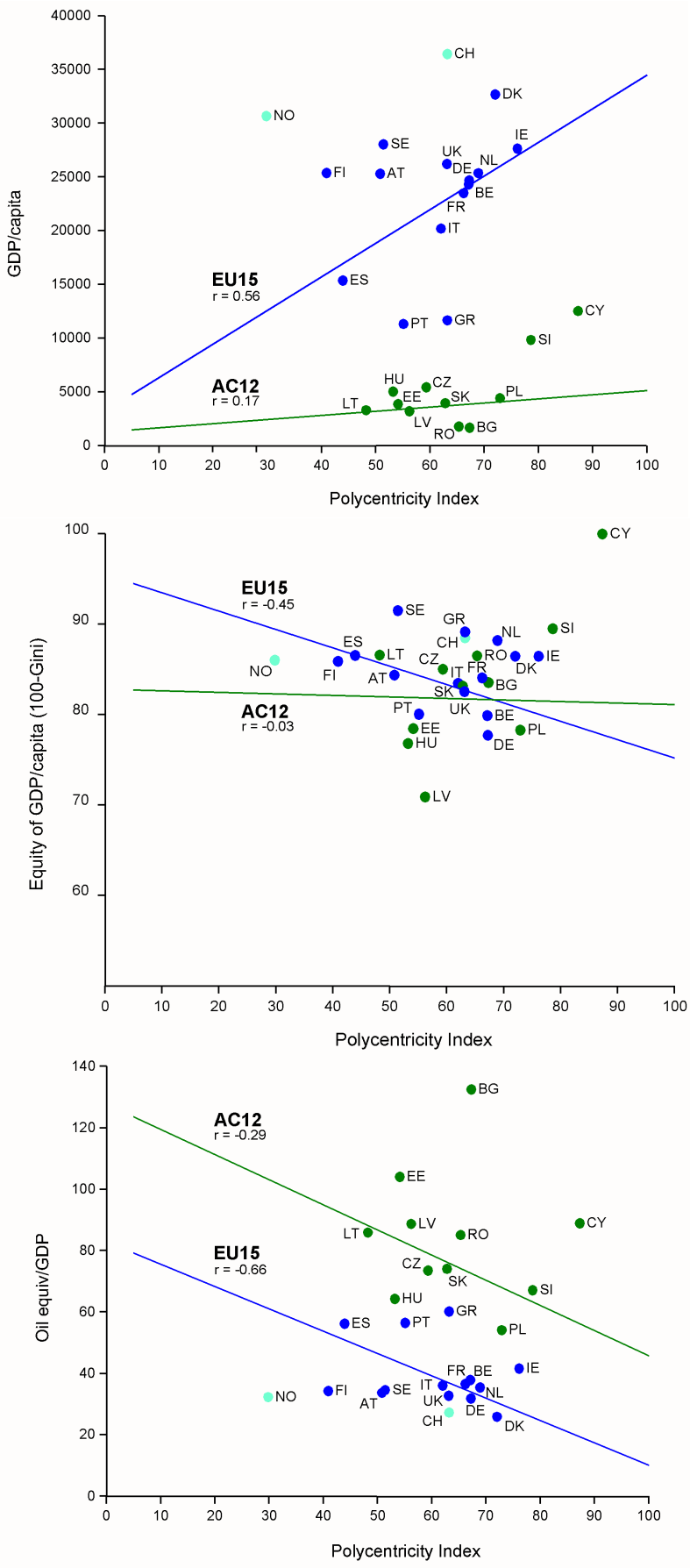


Figure 2-6: Correlation between polycentricity and competitiveness (top), cohesion (centre) and sustainability (bottom) in the accession countries (AC12) and the old EU member states (EU15)

2.2.4 Forecasting polycentricity

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

This was done with respect to the impacts of European transport policy in ESPON 2.1.1. 'Territorial Impact of EU Transport and TEN Policies'. In ESPON 1.1.3 it will be done with respect to the impacts of EU enlargement.

In both projects regional economic models are used to backcast regional economic development during the last two decades and to forecast regional economic development until the year 2020.

First results of forecasting polycentricity are presented in Chapter 5 of this report.

2.2.5 On polycentricity and goal conflicts

In the previous section a comprehensive indicator of polycentricity consisting of the components size, location and connectivity was developed and applied to functional urban regions (FUAs) in the accession countries.

The three component indices, the Size Index, the Location Index and the Connectivity Index measure different dimensions of polycentricity. If aggregated to the Polycentricity Index, significant and plausible differences in polycentricity between countries become apparent.

Polycentricity so defined is associated with major policy objectives of the European Union: Countries with a polycentric urban system are in general economically more successful and environmentally more sustainable than countries with a dominant capital city, but not necessarily spatially more equitable if also rural regions are included.

The method is further developed to forecast the impacts of transport policy scenarios on polycentricity. Based on preliminary results results reported in Chapter 5, it can be observed that the polarisation of the urban systems in the accession countries has increased since their transition from planned to market economies in the 1990s and is likely to increase further in the future.

This creates serious goal conflicts for future EU spatial policy oriented at a balanced polycentric territorial structure of Europe (see Table 2-5). If, for instance, the goal is to strengthen major urban centres outside the “Pentagon”, this will increase spatial disparities between the already too dominant capital cities in countries, such as the Baltic states, Hungary or the Czech Republic. However, if the promotion of balanced urban systems in these countries is a common goal, more Structural Funds and transport infrastructure would have to go into the peripheral regions of the new member states, and this would go at the expense of their capitals.

Table 2-5: Goal conflicts of polycentricity policies for accession countries

Goal	Policy	Goal conflict
Competitiveness at global scale ('Lissabon')	Strengthen highest-level global cities	Polarisation between the global cities and the rest of Europe will increase. The European urban system will be less balanced and polycentric.
Cohesion at European scale	Strengthen major cities outside of Pentagon	The competitiveness of the global cities in Europe may decrease. The urban systems of individual countries will be less balanced and polycentric.
Cohesion at national scale	Strengthen medium-level cities in accession countries	Competitiveness of major cities in the accession countries may decrease.
Sustainability	Strengthen lower-level cities in accession countries	Competitiveness of major cities in the accession countries may decrease.

It is the task of Scenario Study 2 of ESPON 1.1.3 to make these goal conflicts transparent and to offer perspectives towards rational trade-offs.

2.3 Potential Transnational Nodes and Networks in the Enlargement Area

Minas Angelidis

In this section we will use the main results of the previous reports of ESPON 1.1.1 and 1.1.3 as well as other ESPON materials as elements of the hypotheses for "polycentrism" in the enlargement area.

As we stressed previously, it is crucial to identify at this spatial level:

- Cities which could be development nodes competing to the "Pentagon".

- Transnational Urban Networks (TUN) which could also be development entities competing to the "Pentagon", by means of strengthening of the complementarities /networking between their nodes. These TUNs could stimulate the development of Transnational Regions of Integration (TRI), of different spatial integration degree.

We also have to discuss two issues, which are very important in the case of the enlargement area: the constitution of "Transnational cooperation areas" and the impacts of the new (2003) TEN –T.

2.3.1 Cities of the enlargement area which could be nodes of development competing to the "Pentagon"

64 cities in EU27 have or could have a major role in spatial development at European level. They are called Metropolitan European Growth Areas (MEGAs) and are classified in five categories according to their influence to wider regions: Global nodes, European Engines,

Strong MEGAs, Potential MEGAs and Weak MEGAs (Annex 2.4). See for a description of the categories of MEGAs in ? nnex 2.3

MEGAs located in the enlargement area constitute possible "accelerators'' of the enlargement areas' development vis-à-vis the "Pentagon".

In the enlargement area, there are neither "Global nodes" nor "European Engines" Only four "Potential MEGAs" and eleven "Weak MEGAs" are located in this area.

2.3.2 Potential Transnational Urban Networks (TUN) and potential Transnational Regions of Integration (TRI) per macro-region.

In this section we tentatively identify existing and potential complementarities /networking between major cities or, in other words, levels of spatial integration, strengths /opportunities, links -discontinuities.In this exploratory approach we allow for a wide definition of networks and links, namely the intensity of exchange of goods, services and ideas between cities/regions. When we will refer to "macro-regions", this means transnational areas including neighbour national territories having significant relationships concerning their productive systems as well as their transport infrastructures.

In this exploratory work, "macro-regions" are used to describe transnational links and not to designate policy implementation areas.

We will focus here in the transnational roles (Annex 2.5) and links of cities, while the "degree of polycentricity" of the national urban systems is described in section 1.3.2.

2.3.2.1 The macro-region of the three Baltic countries (Estonia, Latvia and Lithuania)

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 Major Urban Systems (MUSs) have nowadays a mainly national role.,

Potential for spatial integration

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 EU15, 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 PolandNo doubt, all these are eventually dissolving after 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.

Poland

The urban system of Poland is very polycentric in all levels – see Annex 2.6

Eight cities have an important transnational role: Katowice (FUR), Wroclaw, Lódz, Gdansk, Krakow, Poznan and Szczecin, while other three cities with a population over 250.000 inhabitants 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 transport and other links / relationships to each other and to the neighbouring MUS remain weak.

Potential for spatial integration

Poland constitutes by itself an important spatial entity, a "macro-region". It could have, by its geographical position and its historical background, important links with the Baltic region as well as with the western and southern Central European space of both EU15 and new countries, 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 EU15 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 new EU countries and neighbour countries. The first discontinuities are gradually eliminated in the process of enlargement of the EU; the second ones will be strengthened. There is a need to bridge discontinuities in both cases.

2.3.2.2 The axial extension of the "Pentagon» and the "Triangle"

Taking into account their potentials in several sectors (economy, transport, higher education etc), Budapest and Prague have 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.

Potential for spatial integration

The links between the MUSs of these four countries and those of the western EU15 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 Ljubljana, 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 erodes the discontinuities between the MUSs of this "macro-region" and those of the neighbouring EU15 countries. But the discontinuities to the MUSs of Romania and Poland will be diminished 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.

Considering[4] the Central European Urban System at a wider scale, growth potential as well as the challenges of old industrial regions are particularly identified in the central transnational macro-region of the accession countries. This covers the transnational territory between Warsaw in the east; Poznan (and possibly Berlin) in the west; and Krakow, Saxony (Dresden), Prague, Bratislava, Vienna and Budapest in the south. This macro-region constitutes a specific transnational entity which includes most of the central European growth poles and innovation potential (capital cities and surrounding areas); the main old industrialised regions in the accession countries; and rural regions undergoing change. This "Triangle"[5] can be seen as a European macro-region which constitutes an agglomerate of major cities; contains significant human resources and innovation potential; and has long industrial traditions comparable to the European macro-region of North-West Europe.

The Balkan countries

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.

[4] This paragraph is reproduced from «ESPON in progress" (2003) page 25

[5] It has already been identified by Gorzelak in 1995 and quoted in the ESPON project 2.2.2 "pre-accession Aid Impact Analysis carried out by IRS, EPRC and CRT

In all Balkan countries and Turkey, the rest of the urban networks (excluding the capital cities) are weak. The MUSs of these countries are weak as well.

Potential for spatial integration

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, Sarajevo 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. Thessalonica is a powerful centre, which already plays an important role in the Balkans that will be strengthened considerably in the future.

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.

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.

2.3.2.3 Transnational Regions of Integration (TRI) of different intensity

Transnational Regions of Integration (TRI) could be defined in different ways. In case we assume that a TRI is characterised by a high level of integration comparable to that of the "Pentagon" the only potential TRI including a part of the new countries is the "Triangle". In case, however, that we also characterise as TRI Transnational Regions with a lower degree of spatial integration, we could include in this second sub–category several Transnational

Regions (TR) small or wide: the three Baltic countries as well as the TR composed by these countries and the other Baltic countries included in the EU15 and so on.

The improvement of the complementarity /networking between the Major cities of these TR will improve their competitiveness vis-à-vis the "pentagon" even they could not form TIRs with high level of spatial integration.

2.3.3 The transnational cooperation areas

Improvement of the transnational cooperation / networking is an important means of counterbalancing concentration in the core of the EU, especially in the case of the new countries where the ability to implement spatial development goals is low. The formation of "Transnational cooperation areas" in this sense depends on several considerations. It depends on the potential TR/TRI, TUN and MEGAs identified above, as well as other considerations as the need to improve the cooperation of some parts of the enlargement area with other parts of the EU27 and the neighbouring to the EU countries (as for example: the Mediterranean space, the countries situated to the east of the EU27 and so on). It also depends on the political will of the interested member states. All these considerations have been more or less taken into account in the formation of different INTERREG spaces.

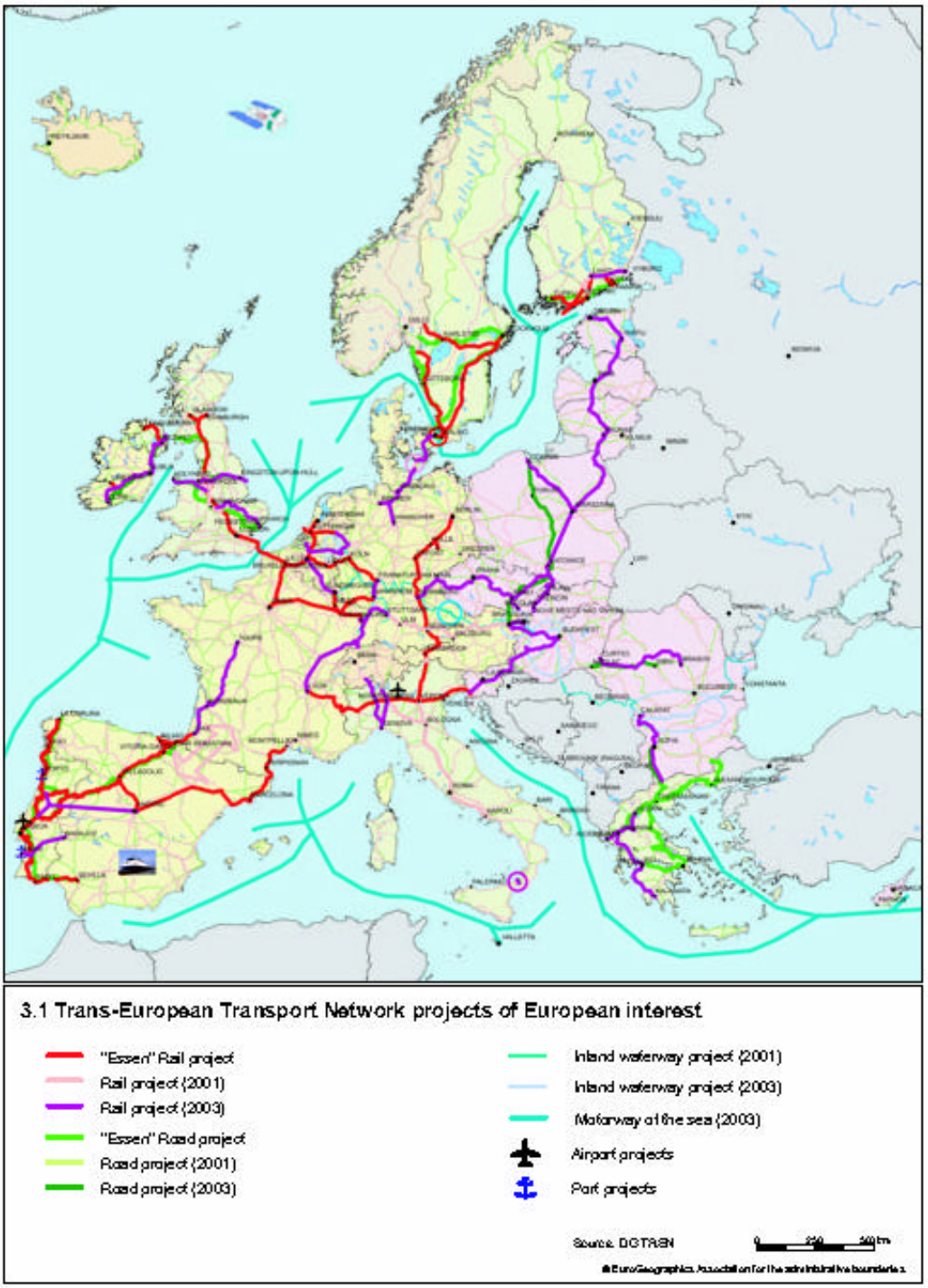
Results from the analysis of spatial discontinuities (cf Chapter 4) in ESPON 1.1.3 will possibly suggest modifications of the already defined INTERREG spaces. In our opinion, the final configuration of these "Transnational cooperation areas" should be made by the European Commission, the member states and the European Parliament which should take into account the ESPON results.

2.3.4 The impacts of the new (2003) TEN –T [6]

The implementation of the new TEN –T projects of European interest (Map 2-1), concerning to a large part the news countries, will undoubtedly favour per priority the capitals and their important cities of the new countries as well as the links between these cities.

[6] Trans-European Networks - Transport

Map 2-1: Trans-European Transport Networks projects of the European interest



More precisely, the following urban networks and potential TRI will be favoured by priority:

- The networking between Tallinn, Tartu, Riga and Kaunas in the three small Baltic countries, then, the links to the rest of the Baltic area and to Poland

- Gdansk – Warsaw - Katowice - Torun in Poland and, then, the links of this network to the wider Baltic area and the axial extension of the "Pentagon".

- The "Triangle" (see above) and its links to the rest of Poland, the wider Baltic area and the "Pentagon".

- The links of the axis Brasov –Sibin –Naorlac to the "Triangle".

- The links of Bucharest to the Danube's influence area.

- The links of Kalafat and Sofia as well as the Western part of Romania and Bulgaria to Greece –mainly to Thessalonica.

It seems that the "Triangle" is more favoured compared to other potential TIR of the new countries.

On the other hand, the links of Romania and Bulgaria to the eastern part of the EU 15 are less favoured.

2.3.5 Transnational Regions and Networks of the enlargement area which could "compete" to the "pentagon":

Considering actual trends as well as the impact of the new TEN-T, we could discern the following spatial entities (Transnational Regions / Transnational Urban Networks (TUN) / Cities) of the enlargement area, which could "compete" to the "pentagon":

- The potential TR formed by the three small Baltic countries containing the potential TUN of Tallinn, Tartu, Riga, Daugavpils, Vilnius and Kaunas and the following potential MEGAs: Tallinn, Riga and Vilnius (Weak MEGAs today).

This TR will have to strengthen its relationships (complementarities / networking) with the rest of the Baltic area (EU15), Poland and the "Triangle".

- The "Triangle" -TRI with potentially high level of integration- encompassing the area from Warsaw in the east; Poznan (and possibly Berlin) in the west; and Krakow, Saxony (Dresden), Prague, Bratislava, Vienna and Budapest in the south. It contains the potential MEGAs: Berlin, Vienna (European engines), Warsaw, Budapest, Prague ("Potential MEGAs" today), Krakow, Wroclaw, Bratislava, Poznan, Lodz and Szczecin ("Weak MEGAs" today).

The rest of the relevant TUN also contains some other FUAs having a limited transnational role.

This TRI has to strengthen its relationships with the "Pentagon", the wider Baltic area, Poland and the Balkan region.

- The potential TR containing the "Triangle" as well as some neighbouring countries / regions: eventually the rest of Austria, Czech Republic, Slovakia and Poland as well as the territory of Slovenia.

- The potential TR of the INTERREG IIIb cooperation area "CADSES" encompassing regions belonging to: Austria, Germany, Greece, Italy, Hungary, Poland, Czech Republic, Slovak Republic, Slovenia, Bulgaria, Romania (EU27), Albania, Bosnia Herzegovina,

Croatia, Serbia and Montenegro, Former Yugoslav Republic of Macedonia, Republic of Moldova, and Ukraine (non Member States).

3 Spatial Diagnosis of Enlargement

Jörg Neubauer

3.1 Snapshots of the European tissue - Visualizing economic and demographic distribution before enlargement

In the following section on spatial distribution 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 generates statements on change in regions' position relative to the total of ESPON.

The change of the position of a region is heavily influenced by its initial size or share in the total of ESPON. This 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.

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

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.

These visual observations made already in our SIR, is complemented by means of a rigorous analysis of spatial association in Chapter 3.4.

3.1.1 Changing Contributions to total population

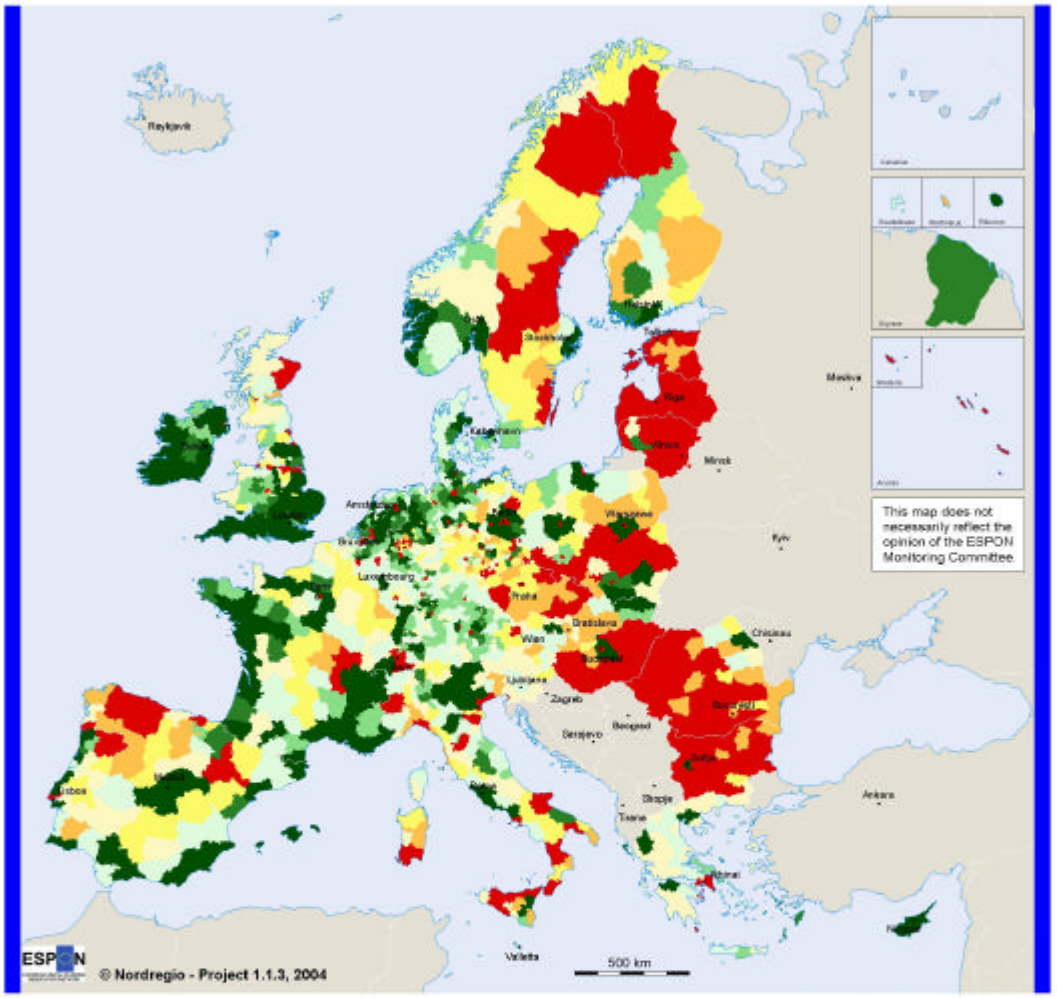
Map 3-1[1] shows the changes in the regional (NUTS 3) contribution to total population in ESPON Space during the last half of the 1990s. The map is revised from the Second Interim Report. In conclusion, this visual examination of redistribution of population indicates that by understanding the ESPON as a market entity:

- There has been an obvious westward shift in population shares along a dividing range from Trondheim in Norway 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 of total ESPON space population
- The three Baltic States suffer from significant population losses during the last decade.

Map 3-1: Redistribution of population

[1] Please note that changes have been made on map 3.1 since the SIR (previously called Concentration of Population). All titles, explanations, annotations and legends have been replaced to improve readability.

Redistribution of population



Region's share of total EU29 population, change between 1995 and 2000

Per thousandth parts %-units

Relative increase

- > 1.5 (> 0.0015 %-units)
- 1.0 – 1.5
- 0.5 – 1.0
- 0 – 0.5

Relative decrease

- 0 – -0.5
- -0.5 – -1.0
- -1.0 – -1.5
- < -1.5

Geographical Base: Eurostat GISCO

Origin of data: Eurostat - Regio; Cyprus, Malta, Norway and Switzerland - National Statistical Offices

Source: ESPON Database

- 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 are losing significantly. Even the patches at the eastern and future external EU25 border
- There are some big urban systems loosing their position to their surroundings, among them, Berlin, Warszawa, Posznan, Gdansk and Budapest
- The urban system of the axial extension of the GIZ of EU-15 - i.e. Czech Republic, Slovakia, Hungary and Slovenia largely form a carpet of relative loss in general.
- Romania and Bulgaria are almost entirely losing in population position being part of the southeastern declining carpet stretching up to Hungary.
- Malta and Cyprus clearly succeded in gaining population weigth during the latter half of the 1990s with Cyprus being in the group of regions heavily improving its postion.

3.1.2 Changing contributions to total GDP in ESPON space

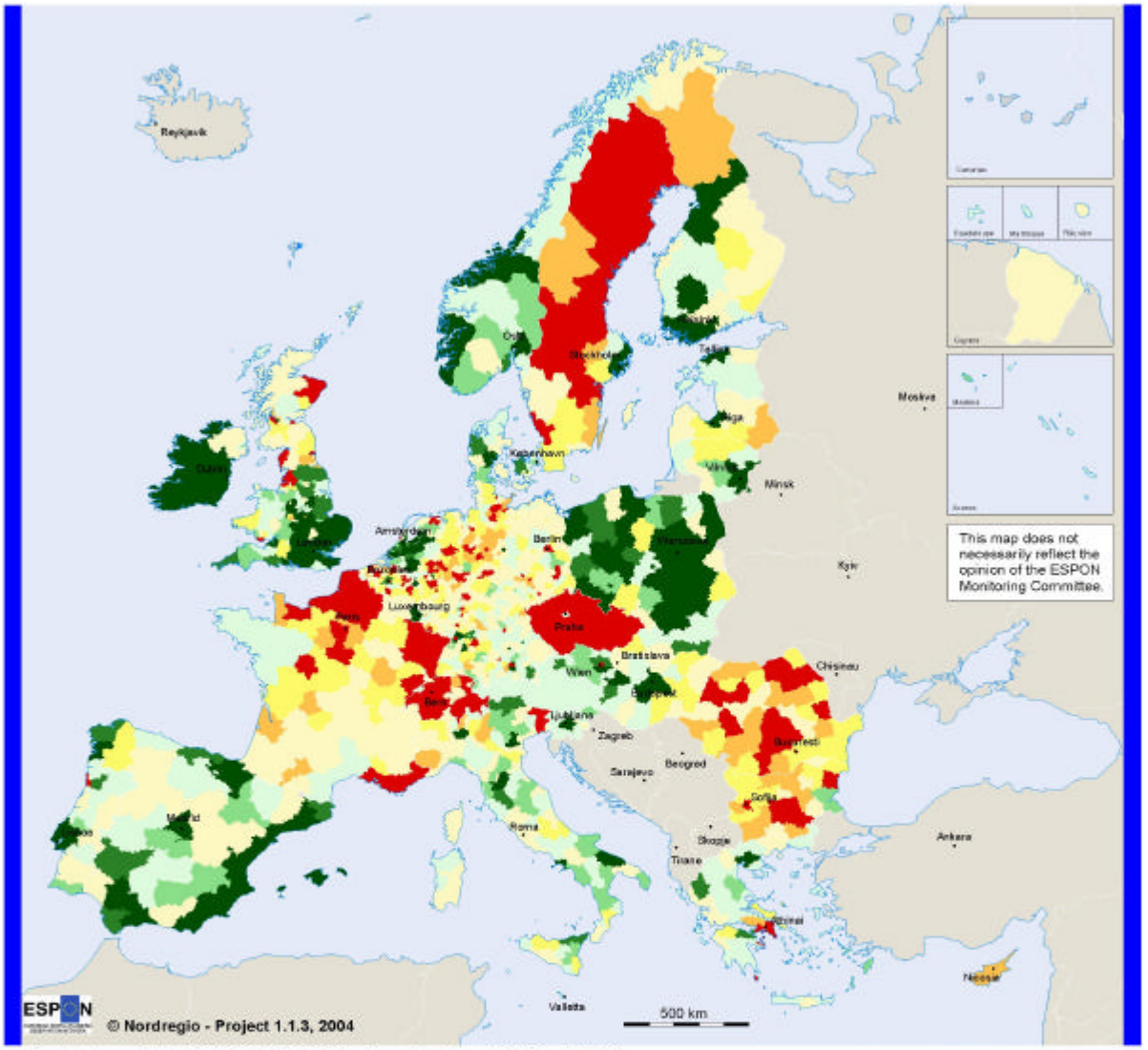
Map 3.2[2] shows the changes in regional (NUTS 3) contribution to total GDP of the ESPON space between 1995 and 2000. The map is revised from SIR It should be remembered that regions experiencing growth in terms of GDP between 1995 and 2000 can turn out to lose their relative contribution to total GDP if they did not exceed the growth rate of total ESPON space. GDP is calculated in running prices for each country since real GDP is not available. This means that in case of high rates of inflation, changes is exaggerated. The map primarily displays spatial patterns of changing contributions to "total" wealth in the enlarged Europe or total ESPON space respectively:

- The Baltic States enjoyed strong growth during the period in many regions and hence could improve their contribution to total ESPON GDP significantly. The success is based on growth in capital regions disfavouring other parts of the countries.

Map 3-2: Redistribution of GDP

[2] Please note that changes have been made on map 3.2 since the SIR (previously called Concentration of GDP). All titles, explanations, annotiations and legends have been replaced to improve readability.

Redistribution of GDP



Region's share of total EU29 GDP in PPS, change between 1995 and 2000

Per thousandth parts %-units

Relative increase

- > 6.0 (> 0.006 %-units)
- 4.0 – 6.0
- 2.0 – 4.0
- 0 – 2.0

Relative decrease

- 0 – -2.0
- -2.0 – -4.0
- -4.0 – -6.0
- < -6.0

Geographical Base: Eurostat GISCO

Origin of data: Eurostat - Regio

Source: ESPON Database

1.

- Poland holds a different position among the countries of the enlargement area. In terms of wealth contribution to the total of the ESPON space it almost entirly comprises a carpet on the rise.
- 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.
- Romania and Bulgaria entirely perform as an economic decreasing carpet in ESPON terms. The spot of Burgas, 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. Malta slightly gains whereas Cyprus faces a rather strong loss.

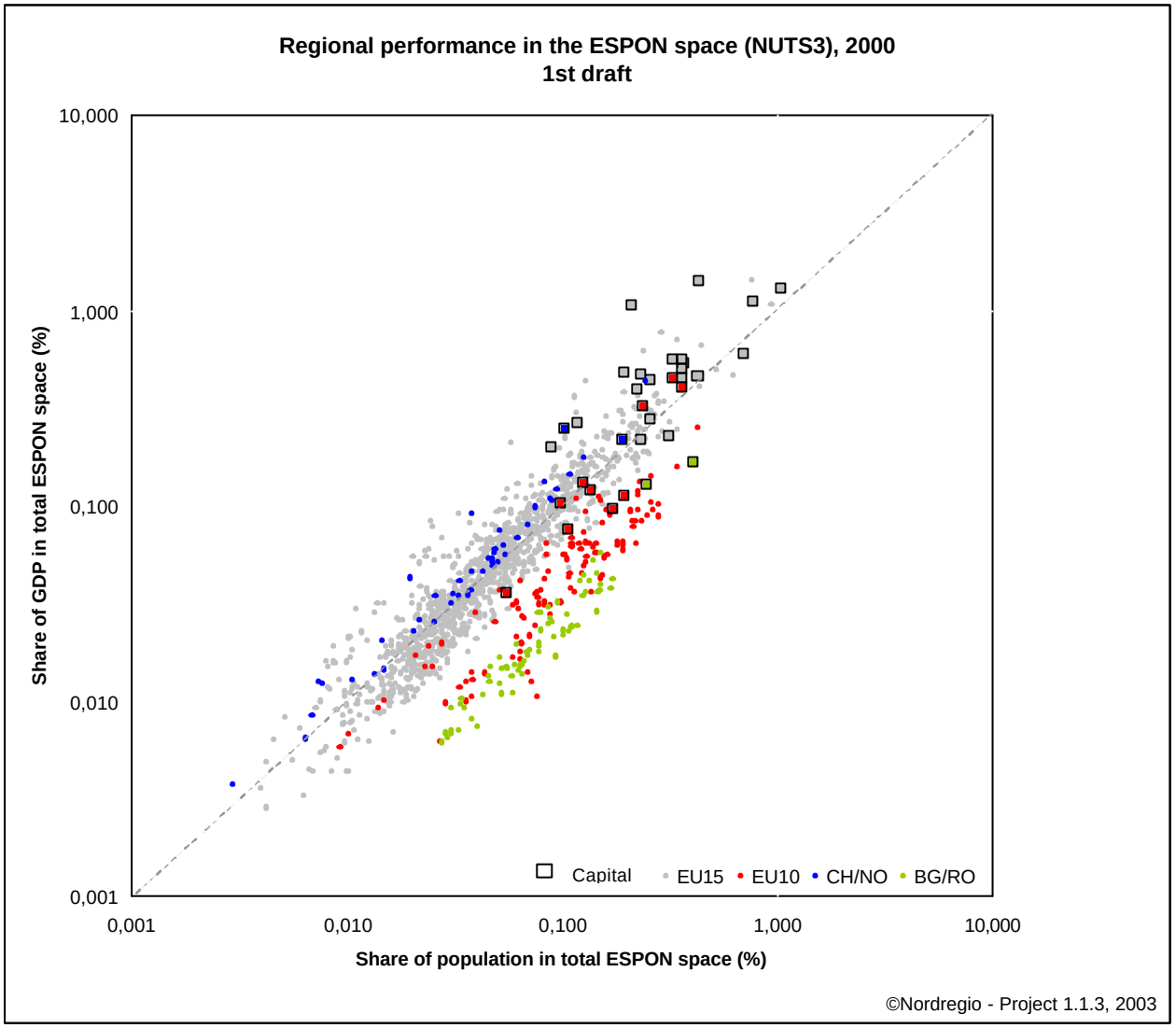
3.1.3 Visualizing performance of each region in EU10 related to ESPON space

3.1.3.1 Different constellations within the ESPON space

Another method to visualize the performance of each NUTS 3 region in the entire ESPON space in terms of its contribution to the total of (a) the ESPON population and (b) the ESPON GDP is shown in Figure 3.1 distinguishing different parts of the ESPON space. Clearly, these type of graphs allows for distinguishing the quite different constellations of regions found in different parts of ESPON space. The size in population numbers and wealth of each region, which is hidden in the previous maps, is clearly visible and add important information. Previous maps indicate where particular needs for development strategies emerge, while these diagrammes indicate the size of these needs. Each graph illustrates the range of differentiation within the regional structure in respective parts of the ESPON space. Capital regions (NUTS3) are marked distinctively. Immediate observations:

- Among EU15 regions widest variation is found, both in terms of population and GDP. Capital regions lead the EU15 contribution but are accompanied by several other strong contributing regions throughout the territory.
- 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 relatively more than those of EU15.
- 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.

Figure 3-1: Regional performance in ESPON space 2000



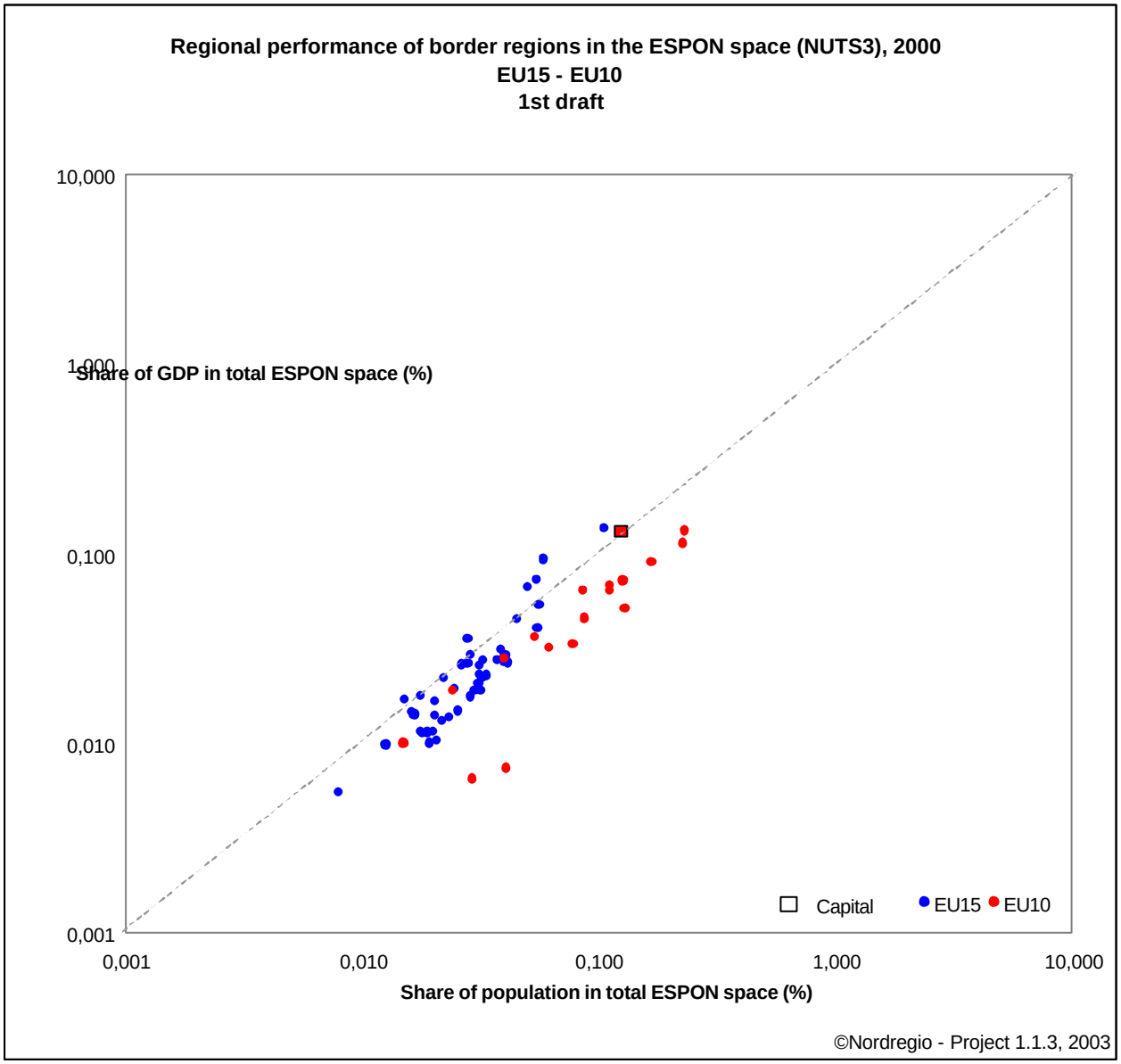
* For data please see APPENDIX Tables A1-3 in SIR

3.1.3.2 Visualizing performance of each border region EU15-EU10 related to ESPON space

The figures below illustrates the various constellations of regional performance in the ESPON space and in the border regions of the ESPON space 2000. The border regions 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 (Figure 3.2). 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). On the other hand, the gap is very large between the external EU borders in EU15 and in EU10 states (Figure 3.3). This graphic

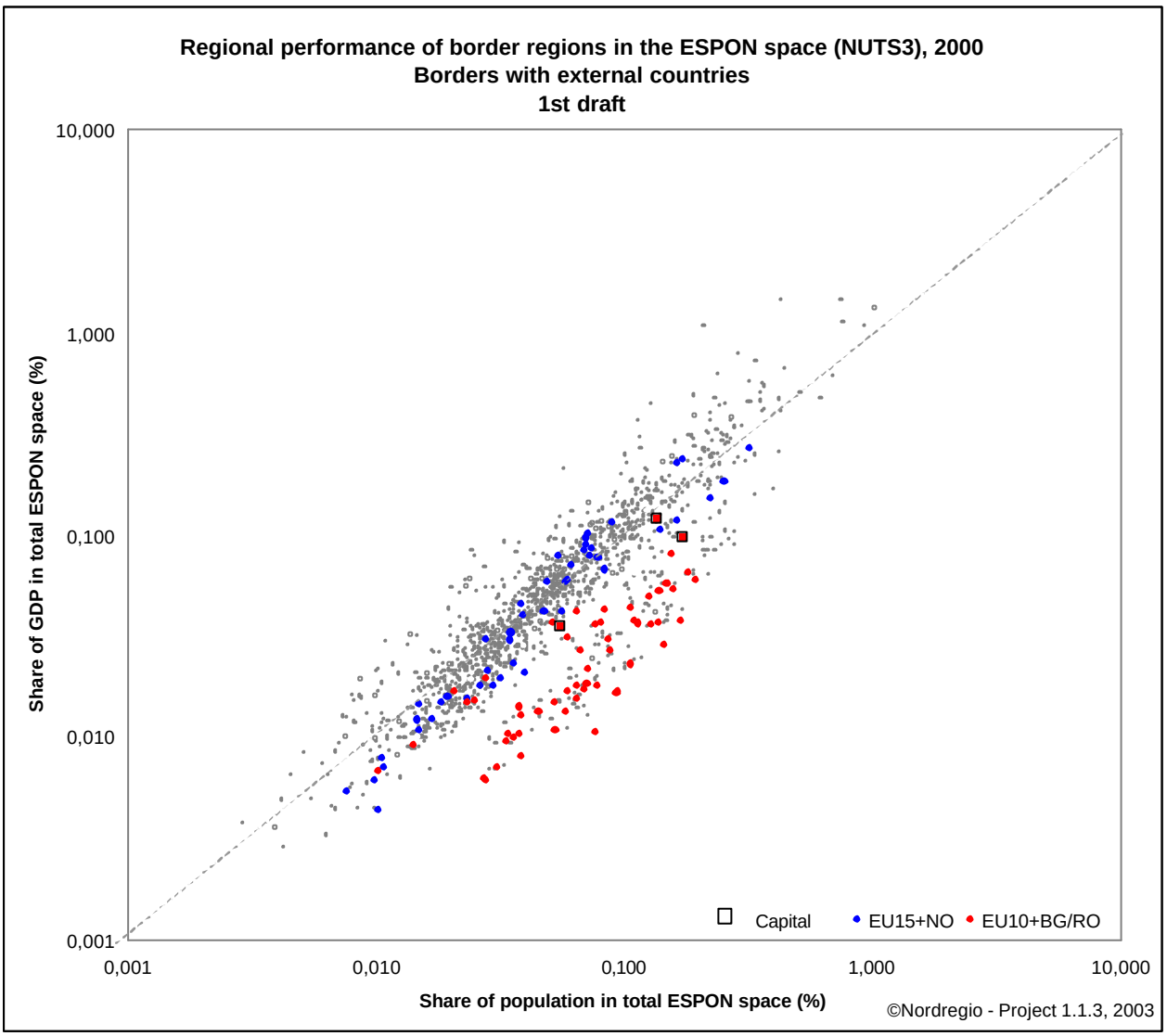
illustration of very differential performance of border regions deeply involved in and influenced by the current enlargement of the EU will be subject to a deeper quantitative analysis, leading to a typology of border regions, in section 4.3.

Figure 3-2: Regional performance of border regions at the EU15-Accession country border 2000



* For data please see APPENDIX 2 in SIR

Figure 3-3: Regional performance of border regions to external countries 2000



3.2 Examination of convergence/divergence trends with regards to EU10 regions

Jos Muskens, Pieter de Bruijn

3.2.1 Introduction

Comparative analyses of integration processes between transnational and cross-border regions and their effects on the convergence and divergence processes are important with regard to the enlargement process. The question is which approaches are to be followed towards a better transnational and cross-border integration. In this section we identify the general discontinuities and barriers at European scale using fundamental economic indicators such as differences in wealth and unemployment. This is accomplished using specific methods depending on the process described and analysed, and depending on the data availability.

Economic performance indicators should say something about the economic dimensions of convergence. Obvious indicators here are Gross Domestic Product (GDP) per capita, productivity, employment, accessibility, innovation and R&D expenditures. In this section we concentrate on the GDP per capita indicator and add information about unemployment, to be able to comment on the social dimensions of convergence as well.

3.2.2 Economic Convergence

GDP per capita

The map in Annex 3.1 presents an overview of GDP per capita in Purchasing Power Standards (PPS) in 2000, for all NUTS-3 regions in the EU25 plus Norway, Switzerland, Bulgaria and Romania. Setting the EU-average at 100, it is quite remarkable to see that most regions are below this level, also in the EU15 member states. Clearly, most GDP is earned in economic centres, generally located around big (capital) cities with a relatively small surface area. Therefore, on the Map only a few red 'hot spots' can be found (e.g. Paris, London, Brussels, Oslo, Munich), while most of the regions are either pale red (just above average) or pale blue (just below average). Poorest regions are located in Bulgaria and Romania, and also in Poland and the Baltic States. In general, the new accession countries are clearly behind the EU average. Compared to the rest of the country, the EU-15 border regions in Hungary, Czech Republic, Slovakia and Slovenia seem to benefit from the neighborhood of successful EU15-regions (South-East Germany, Vienna, North-East Italy).

The GDP per capita development from 1995 to 2000 reveals that many regions in the new EU member states have experienced relatively strong GDP growth (See Annex 3.2)[3]. Among those strong growers are regions in the Baltic States (capital cities), Poland, Hungary and Slovenia. The Czech Republic was not able to join in this positive development. Within the

[3] Note that development of GDP per capita is including inflation. So far, the ESPON database only contains GDP data in running prices, not (yet) in constant prices.

EU15, all regions in Ireland benefited from the fast growing economy in the country. Furthermore, regions in Greece, Portugal, Spain, Italy, Austria, the Netherlands and the South of the United Kingdom (UK) enjoyed a growing economy, while France, Sweden and the North of the UK stayed behind. Outside the EU25, Norway experienced growth, while most regions in Bulgaria and Romania were not able to catch up. Switzerland suffered from a relatively strong decline.

Beta- and Sigma-convergence

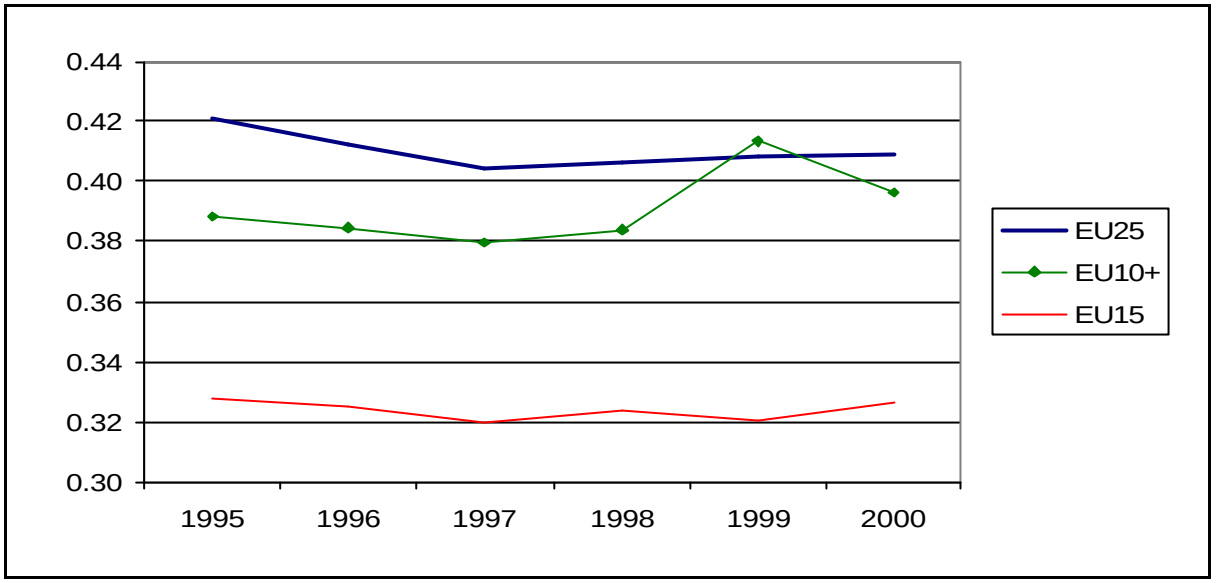
There have been numerous attempts to provide a proper definition of convergence (e.g. Quah, 1996). Two concepts stand out in the empirical literature: ß-convergence (Beta) and s-convergence (Sigma).[4] This section defines both concepts and discusses the empirical evidence for the EU. It concentrates on whether relatively poor regions in Europe have caught up with richer ones, and how regions differ in this convergence (or divergence) process within countries and between countries, with a special focus on the position of border regions.

When the focus is on *dispersion in wealth between regions* or nations, the concept of **s-convergence** is perhaps the most useful concept. It is based on the standard deviation, across regions, of the logarithm of real GDP per capita. When the standard deviation declines over time σ-convergence applies. Table 1 (final three columns) provides an overview of the σ-convergence statistics in each country between 1995 and 2000.

There are not many countries showing evidence of convergence (decreasing s). In fact, only Greece, Italy and Portugal have a s in 2000 which is more than 3% lower than it was in 1995. More striking evidence can be found for divergence (increasing s). For nearly all accession countries this is the case: the Baltic States, the Czech Republic, Hungary, Poland and Slovenia. In all those countries dispersion in GDP per capita has grown significantly between 1995 and 2000. Other countries with similar developments are Switzerland, Finland, Ireland, Romania and Sweden. Combined with Map 2, one may conclude for the accession countries, that average GDP per capita has been growing, but that the gap between poor and rich regions has been widened at the same time.

[4] This terminology was first introduced by Sala-i-Martin (1990).

Figure 3-4: Standard deviation of log (GDP per capita) in PPS, 1995-2000, for NUTS3 regions in EU15, new accession countries (EU10+), and the EU25 altogether



Source: TNO Inro, based upon ESPON database

Figure 3.4 plots the s development over time, for the EU15 regions, the regions in the accession countries (EU10+), and for the EU25 regions altogether. As we can see in Table 3.1, variation among regions is more apparent within the 10 accession countries than within the EU15 member states. In the development over time, the standard deviation hardly changes (apart from the 1999 peak in the accession countries). For both the old and new EU member states, there has been some convergence up to 1997, but since then on to 2000 a process of slight divergence started.[5]

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

Table 3-1: Convergence within countries, 1995-2000

Country	# NUTS3 regions	Rate of convergence (ß)[1]	ß convergence?	s (1995)	s (2000)	s convergence ?
AT	35	-0.273	yes	0.263	0.257	yes
BE	43	0.640	no	0.271	0.283	no
BG	28	-0.292	yes	0.208	0.210	no
CH	26	0.359 *	no	0.168	0.219	no
CZ	14	0.588 **	no	0.206	0.252	no
DE	441	0.005	no	0.360	0.367	no
DK	15	-0.001	yes	0.220	0.222	no
EE	5	0.657	no	0.329	0.378	no
ES	52	0.063	no	0.208	0.213	no
FI	20	0.258	no	0.171	0.202	no
FR	100	-0.097	yes	0.220	0.219	yes
GR	51	-0.311 **	yes	0.235	0.224	yes
HU	20	0.581 **	no	0.237	0.302	no
IE	8	0.721 **	no	0.194	0.226	no
IT	103	-0.415 **	yes	0.281	0.270	yes
LT	10	0.799 **	no	0.142	0.253	no
LV	5	0.847 *	no	0.317	0.570	no
NL	40	-0.220	yes	0.209	0.203	yes
NO	19	0.030	no	0.196	0.204	no
PL	44	0.299 **	no	0.310	0.350	no
PT	30	-0.247	yes	0.262	0.254	yes
RO	42	0.244	no	0.180	0.212	no
SE	21	0.117	no	0.078	0.104	no
SI	12	0.251	no	0.131	0.148	no
SK	8	-0.164	yes	0.331	0.328	yes
UK	133	0.109	no	0.255	0.267	no
EU15	1093 [2]	-0.129 **	yes	0.328	0.326	yes
EU10+	120 [3]	-0.090	yes	0.388	0.396	no
EU25	1213 [4]	-0.248 **	yes	0.421	0.409	yes

Source: TNO Inro, based upon ESPON database

[1] * (**) indicates significance at the 10% (5%) confidence level;
[2] including Luxemburg; results without are nearly the same;
[3] including Cyprus and Malta; results without are nearly the same;
[4] including Cyprus, Luxemburg and Malta; results without are nearly the same;

Another convergence concept is the so-called **ß-convergence**. It results from a neo-classical growth framework. In particular, it refers to the coefficient ß in the following equation:

(1) $$Y_{i,T} = a + ß \ln Y_{i,t_0} + u_{i,T}$$

where $Y_{i,T}$ denotes the average yearly growth rate of GDP per capita in region i between the years t_0 and T, Y_{i,t_0} is initial GDP in year t_0 and and $u_{i,T}$ represents the specific shocks between times t_0 and T. In our case, t_0 = 1995 and T = 2000. The ß-coefficient measures the *speed of convergence*. A negative coefficient denotes convergence. Column 3 in Table 1 lists the estimated ß-coefficient for all countries individually, as well as for the EU15, EU10+ and EU25. The estimated ß-coefficient for the EU15 is significantly negative, as well as for the EU25, while it is slightly negative 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 group of new member states.

If we take a closer look at the situation within countries, some important findings appear. The Czech Republic, Hungary, Latvia, Lithuania and Poland are accessing countries with a significantly positive ß-coefficient, which implies divergence in GDP per capita. The relatively polycentic urban structure in Poland is obviously not reflected in a more convergent behaviour of the economy. Also, in Switzerland en Ireland significant signs of divergence come forward. For Greece and Italy the estimated ß appears to be significantly negative, which points towards convergence of GDP per capita between 1995 and 2000. About half of the EU15 member states show signs of convergence, although the ß-coefficient is not significant in most cases. Based on these findings, a general conclusion cannot be made, but on average the EU15 member states, compared to the new accession countries, have (a) higher GDP per capita levels, (b) lower GDP per capita growth and (c) stronger sings of convergence.

Conditional convergence

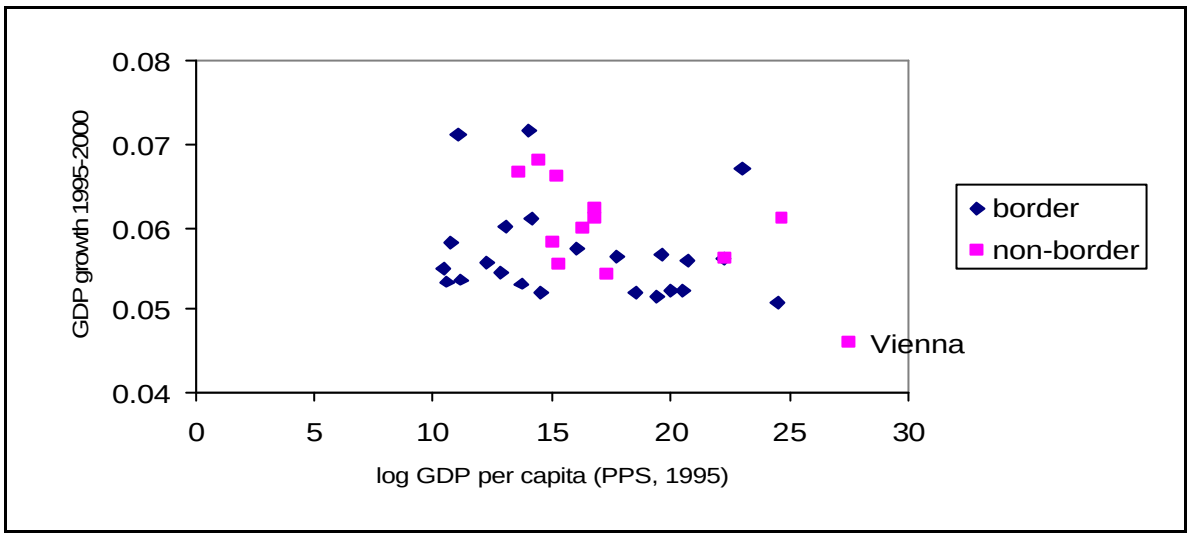
The way the ß-coefficient is estimated in equation (1) is described as the concept of *unconditional convergence*. This concept assumes that all regions converge to the same steady state level of income. This assumption may be too unrealistic for the different European regions. It seems more likely that steady states differ among EU-countries because of variation in institutional settings, sector patterns of production (due to different comparative advantages, see also section 3.4), educational levels, technology etc. If countries differ in these respects, the correct formulation of equation (1) should control for variables that affect the growth rate of the economies. In this way, the influence of initial backwardness on growth can be separated from other influences. The relevant question then is, whether economies tend to converge to the same level of per capita GDP, provided that other factors are conditioned for. This alternative concept is called conditional ß-convergence: convergence that is conditional on the country-specific steady-sate level. In equation (1) extra explanatory variables are added which represent the country-specific factors. However, these factors are hard to measure and data are generally difficult to get. Interestingly, a variety of studies which explored conditional convergence have found that estimates of ß do not change substantially

when these control-variables are included (see e.g. Barro, 1991). At this stage we make no further attempt to estimate conditional ß-convergence. For the final report next year, we will explore further on this conditional concept.

Border regions

With regard to the enlargement process, it is of special interest to view the spread of income related to the position of border regions. For each country, the GDP per capita growth rate has been plotted to the initial level of (the logarithm of) GDP per capita (PPS) for all NUTS-3 regions. Figures 3.5 and 3.6 show what kind of findings can be derived from this explorative analysis.

Figure 3-5: Convergence in NUTS-3 regions in Austria (1995-2000)



Source: TNO Inro, based upon ESPON database

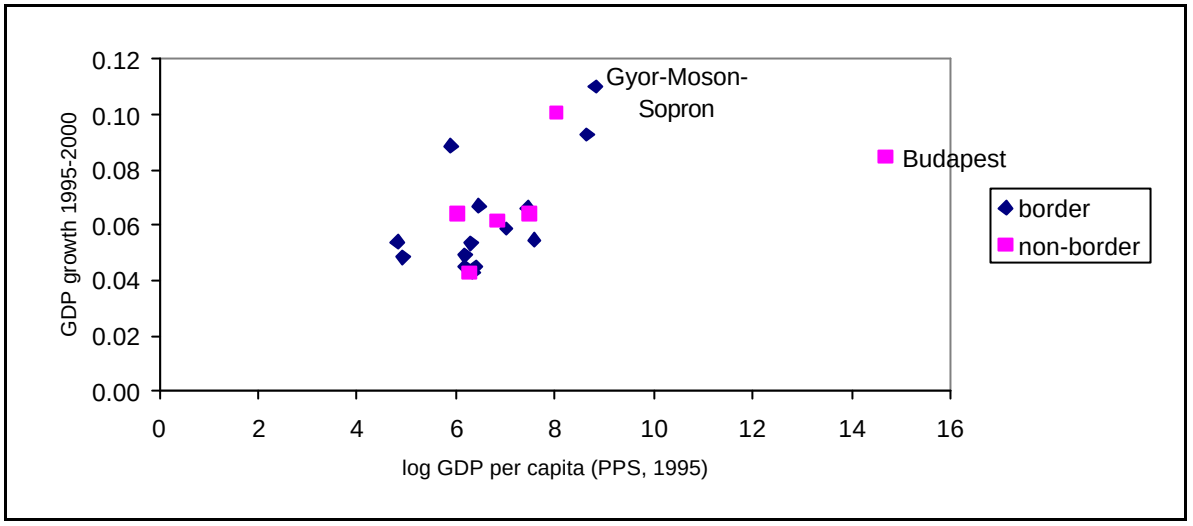
Figure 3.5 confirms the estimation results listed in Table 3.1: the ß-coefficient for Austria is negative (although not significant), or: the higher the level of GDP per capita, the lower the GDP growth rate. This holds for both border and non-border regions, but non-border regions tend to have a slightly stronger rate of convergence. Also, the non-border regions tend to have higher GDP per capita levels, with the (administrative) Vienna region clearly on top. In a functional sense, Vienna is rather part of a border region.

Although Austria does not represent all European countries, the difference between the situation of border regions and non-border regions is approximately the same in all other countries: the capital region (mostly non-border) is the nation's economic centre, while the border regions are relatively more behind. This may lead to the conclusion that the neighborhood of a national economic centre is more important than the neighborhood of a national border. But what happens when an economic centre across the border is nearby?

One striking example of such a situation is the region of Badajoz in South-West Spain. It is in between and not far from the two capitals Lisbon and Madrid, but it has the lowest level of

GDP per capita of Spain. But there are other examples, as Figure 3.6 shows. The ß-coefficient for Hungary is significantly positive. Welfare in Hungary diverges. Both border regions and non-border regions tend to have higher GDP growth rates with higher GDP per capita levels. The Budapest region is clearly leading in GDP per capita. But the region of Gyor-Moson-Sopron experienced the strongest growth from 1995 to 2000. This border region is located North-West, near Austria and Slovakia. Budapest is not far, but neither are Vienna and Bratislava.

Figure 3-6: Convergence in NUTS-3 regions in Hungary (1995-2000)



Source: TNO Inro, based upon ESPON database

To conclude, being a border region seems to be disadvantageous, since its location is often far from the national economic centre. It can however be advantageous when a foreign economic centre is close. This conclusion is preliminary. No need to say that accessibility is an important condition, as well as population growth and other location factors. Section 3.3 elaborates more on the subject of proximity and Chapter 6 widens the descriptive analysis of border region characteristics.

3.2.3 Social Convergence

Unemployment

GDP per capita is used as an indicator for economic performance of regions, providing insight in the economic dimensions of convergence. Wealth performance indicators should indicate roughly the social dimensions of convergence. The difference between economic performance and wealth performance 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 coordinated 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 coordinated development programs can be determined, for each type of policy.

One social cohesion indicator is the unemployment rate, for which data are available through the ESPON database (Annex 3.3).[6] Within the EU15 member states, unemployment is highest in South-West Spain, South-Italy, East-Germany and some regions in Finland and France.

The map in Annex 3.4 relates the unemployment rate to the level of GDP per capita in each NUTS-3 region. For many regions, low GDP per capita goes along with high unemployment rates (blue areas). Also, it is no surprise when regions with high GDP per capita enjoy low unemployment rates (red areas). There are quite some regions, though, in which high GDP per capita goes along with high unemployment rates (yellow areas). In those regions many inhabitants, apparently, do not benefit from economic welfare (e.g. Madrid, Rome, Bordeaux, Lyon). Finally, the green areas represent those regions, which have low GDP per capita together with low unemployment rates. This situation occurs in Portugal, Central Europe, and parts of the UK, Ireland, Sweden and Romania.

3.2.4 Key findings and policy implications

In this section we investigated the convergence/divergence process with regard to regions within the EU15 and the accession countries. We have found:

- For the accession countries, it is obvious that GDP per capita on average has been growing, but that the gap between poor and rich regions has been widened at the same time. Particularly in the Baltic States, the Czech Republic, Hungary, Poland and Slovenia, dispersion in GDP per capita has grown significantly between 1995 and 2000.
- Variation among regions is more apparent within the EU10 member states than within the EU15 member states. Also Poland, with a polycentric urban structure, shows a diverging regional economy. Only Greece, Italy and Portugal show some signs of convergence.
- On average the EU15 member states, compared to the new accession countries, have higher GDP per capita levels, lower GDP per capita growth in combination with stronger signs of convergence. Within countries, generally non-border regions perform better than border regions, both in GDP level and in GDP growth. Exceptions are border regions near foreign economic centres, especially those in Central Europe.
- Apart from economic convergence, policy makers should pay an interest at social convergence. A high GDP per capita does not automatically imply a low unemployment rate. In for example Madrid and Rome, high GDP per capita goes along with high unemployment rates. In those regions many inhabitants do not benefit from economic welfare. Regions with low GDP per capita together with low

[6] No data available for Switzerland, Malta and Norway

unemployment rates also occur, particularly in Portugal, Central Europa, and parts of the UK, Ireland, and Sweden. There was one sentence that is omitted here. In EU 10, large parts of Hungary, Romania and Cyprus have relatively low unemployment, while i a Poland, the Checz Republic, Slovakia and the Baltic states have relatively high unemployment. This was the situation in 2000.

Further considerations

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 more important issue. We will approach these issues in the next section (3.3), and in Chapter 4, 5 and 6. Factors as clustering and specialization of industrial sectors, accessibility and borders as barriers and bridges are analysed as prominent driving forces.

Possible Policy combinations

The new accession countries are catching up with the EU15 member states when looking at GDP per capita. Levels are still behind, but growth rates are higher. However, at the same time spread of GDP among the regions is diverting. The capital regions take account of most of the national growth. This development will probably not change much after the EU enlargement. Capital regions will attract most of foreign direct investment, and benefit more from export growth. Only when (border) regions are near to foreign economic hot spots, like for example in Central Europe, they can benefit from enlargement away from their national capital. European and national policy makers should be aware of the risks of divergence in the accession countries.

They should also distinguish between economic divergence and social divergence. GDP in region A can be earned by inhabitants of region B. For some regions, cohesion policies could better be oriented towards neighbouring regions than towards the region itself. This implies a need for horizontal coordinated 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 coordinated development programs can be determined, for each type of policy.

3.3 Financial system, exchange rate and polycentricity in the context of European enlargement. A conceptual and empirical framework

José Corpataux

3.3.1 Problem setting

Will the financial and monetary integration have beneficial repercussions for all the actors that make up the European economy or will it provoke on the contrary some spatial discontinuities? The main objective of this analysis is to identify the effects of the enlargement process on economic and urban structures in a context of financial and monetary integration. Our research hypothesises are mainly based on previous works and studies realised in Switzerland and in the United Kingdom (Dow, 1998 and 1999; Crevoisier, Corpataux and Thierstein, 2001; Corpataux and Crevoisier, 2001; Corpataux, Crevoisier and Thierstein, 2002; Corpataux and Crevoisier, 2003).

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3.3.2 What are the spatial connections and barriers due to financial and monetary integration?

In a first phase differences in economic structures between EU new Member States are described. In a second phase the importance and the evolution of some important financial and monetary variables (financial system evolution, foreign direct investment level, exchange rate evolution) are described. Finally some scenarios are constructed assessing the possible national/regional trajectories of these countries under various financial and monetary trends/constraints.

Our empirical work is focused mainly on the ten new EU member statesOur empirical work is focused mainly on the ten new Member States (and the two ones who will join in 2007, Bulgaria and Romania.

Comparing new EU Member States' sectoral features at a national scale: first results

In order to catch the potential effects of a monetary or financial integration process the economic structures – main economic specialisations and capacities to export – are described. Indeed different countries with different structures will react differently to the same process. When data are available we describe the evolution of these structures.

3.3.2.1 A branches' analysis

The number of people employed in each branch reveals the structure and composition of a country's economy. Tables 3.2 and 3.3 illustrate the percentage held by each branch in the candidate countries in 2000 and employment's evolution in each branch between 1995 and 2000.

In 2000 manufacturing was still the largest branch in terms of labour in four of new EU Member States (the Czech Republic, Estonia, Malta and Slovenia) and the second largest in all the others for whom data were available. Agriculture took the first place in four countries (Romania, Bulgaria, Poland and Lithuania). Nevertheless most of these countries knew an important employment's decrease in these two branches between 1995 and 2000. All countries experienced marked declines in manufacturing employment, ranging from falls of 7% in Lithuania and Poland to 26% in Bulgaria and Romania. In agriculture Czech Republic, Estonia, Latvia, Lithuania and Slovenia all saw falls of more than 18%. Only Romania and Poland knew an increase in agricultural employment, respectively 9% and 3% more in 2000 than in 1995.

Considering financial activities employment is important in Cyprus with more than 5%, Malta follows with a little less than 4%. All the others seem to have less developed financial activities. Between 1995 and 2000, financial activities' employment increased in most of the candidate countries, especially in Cyprus (+27%). Nevertheless two countries knew an important decrease in the branch with 25% in Bulgaria and 24% in Lithuania.

Table 3-2: employment by branch in 1995 and 2000 (BG, CY, CZ, EE, LT)

3.3.2.1.1 Branch	BG		CY		CZ		EE		LT	
	Branch in country's total employment 2000	Variation (%) 1995-2000	Branch in country's total employment 2000	Variation (%) 1995-2000	Branch in country's total employment 2000	Variation (%) 1995-2000	Branch in country's total employment 2000	Variation (%) 1995-2000	Branch in country's total employment 2000	Variation (%) 1995-2000
Agriculture	26.7	-2	8.6	-11	5	-26	6.9	-33	19.6	-20
Fishing			0.5	27	0.1	21	0.5	-48	0.1	-22
Mining	1.3	-39	0.2	-14	1.5	-28	1.3	-14	0.2	-15
Manufacturing	19.8	-26	11.9	-18	27.1	-10	22.6	-15	17.7	-7
Utilities	2	3	0.5	7	1.6	-24	2.6	-1	2.4	-11
Construction	4.1	-27	8.1	-5	9.3	-4	7	20	6.1	-16
Trade & repair	12	10	17.7	8	13	-1	13.9	2	14.7	10
Hotels & Restaurants	2.6	2	11	10	3.3	2	3.5	17	1.8	44
Transports & Comms	7.6	-11	7.3	22	7.9	-2	9.9	-8	6.3	6
Financial	1.1	-25	5.2	27	2.1	9	1.3	15	1	-24
Real estate	4.1	18	4.8	20	5.6	8	6.9	30	3.2	3
Public goods	3	22	7.1	17	7.2	13	6	2	4.5	7
Education	7.3	-16	5.3	20	6.3	-3	7.7	-16	10.2	14
Health & social work	5.1	-20	3.9	16	6.1	3	4.9	-19	7	8
Other	3.1	-11	8	27	3.8	4	5.1	3	5.1	-1
Total (Mio. Jobs)	2.9	-10	0.3	6	4.7	-5	0.6	-7	1.6	-4

Source: Codd (2002)/Eurostat.

Table 3-3: Employment by branch in 1995 and 2000 (LV, MT, PL, RO, SI)

3.3.2.1.2 Branch	LV		MT		PL		RO		SI	
	Branch in country's total employment 2000	Variation (%) 1995-2000	Branch in country's total employment 2000	Variation (%) 1995-2000	Branch in country's total employment 2000	Variation (%) 1995-2000	Branch in country's total employment 2000	Variation (%) 1995-2000	Branch in country's total employment 2000	Variation (%) 1995-2000
Agriculture	14.7	-19	1.6		25.7	3	41.4	9	10.2	-18
Fishing	0.6	21	0.3		0.1	-22			0	7
Mining	0.2	-35	0.5		1.8	-28	1.6	-44	0.7	-31
Manufacturing	16.2	-13	23.9		18.9	-7	19.6	-26	28	-14
Utilities	1.7	4	2.3		1.7	-8	2	1	1.3	-6
Construction	6.3	16	7.6		6	10	4.1	-26	7.5	20
Trade & Repair	16.8	19	14.1		13.9	15	9	-10	13	6
Hotels & restaurants	2.5	11	6.7		1.4	9	1.1	-25	4.1	7
Transports & comms	8.2	-7	8.2		5.6	2	4.9	-25	5.7	1
Financial	1.6	18	3.8		2.1	24	0.9	4	2.3	11
Real estate	5.5	14	3.9		5	37	3.1	-16	6.3	19
Public goods	6.1	11	9.4		3	20	1.7	12	4.9	24
Education	8.4	-3	7.8		5.9	7	4.9	-3	6.1	11
Health & social work	5.7	-9	6.8		6.5	-1	4	2	6.1	21
Other	5.6	31	3.2		2.5	19	1.9	-18	3.8	19
Total (Mio. Jobs)	1	-1	0.1		15.4	4	8.6	-9	0.9	0

Source: Codd (2002)/Eurostat.

3.3.2.2 Highlighting some financial and monetary variables

In order to catch the economic trajectory of new EU Member States it is necessary at this stage to describe the level/evolution of some important financial and monetary variables.

3.3.2.3 Financial system evolution

Banking sectors in most of the new EU Member States differ widely from those of the Western countries due to their past. During the socialist period banks were primarily bookkeepers for the planned allocation of resources. Thus the decision for the allocation of credits was not taken by the banks, but by the planning system (Fries and Taci, 2002; Haselmann, 2003). Today they are on average to a higher degree concentrated, state owned, but also show a high degree of foreign penetration (Haselmann, 2003). Nevertheless financial systems in new EU Member States are still heavily bank based (Demirgüc-Kunt and Levine, 2001). Stock markets still play a secondary role comparing to the banking sector within the financial systems of those countries (Haselmann, 2003).

Spatially, bank based systems are generally more polycentric than finance based ones. Moreover a polycentric banking system can irrigate in a better way the whole economy of a country. A liberalisation process and the corollary move to a more finance based system generally provokes the concentration of financial activities in the main financial centres at the national scale as well as at the international one. Peripheral regions and SMEs could therefore suffer from credit rationing (for further explanations: see Dow, 1999).

Is there a move to a more finance based economy in some of the new EU Member States? Market capitalisation evolution can be a first and useful indicator to capture such a move. The stock markets are still underdeveloped by Western European Standards. Table 3.4 gives an overview of the development of the financial markets in new EU countries. If Estonia and Hungary knew a strong development of their stock market capitalisation relative to GDP and were exceeding 30% in 2000 – while the Czech Republic and Poland were exceeding 20% – all the others were really below 20%.

Table 3-4: Market capitalisation in new EU Member States, percentage of GDP, mid-period, 1994-2000

Country	1994	1995	1996	1997	1998	1999	March 2000
BG	0	1	0	1	8	6	5
CZ	14	30	31	24	21	19	25
EE	0	2	10	11	28	31	36
HU	3	5	12	33	29	31	34
LV	0	1	3	6	6	6	8
LT	1	2	11	18	10	12	11
PL	3	4	6	8	13	18	21
RO	0	0	0	2	3	2	2
SR	8	7	12	9	5	4	3
SI	4	2	4	9	13	11	12

Source: Claessens, Djankov and Klingebiel (2000).

3.3.2.4 Foreign Investment in New EU Member States-Highly Concentrated to Capitals

If banks are not able to sustain economic development – via traditional credits – foreign financing could be a possible substitute. Table 3.5 presents FDI inflows in 2000 and 2001 for each new EU Member State. Regarding FDI inflows over GDP in 2001 four countries are able to drain a high level of investment: Estonia (9.8), Malta (8.7), Czech Republic (8.6), Slovakia (7.2). All the others are below five percent.

Table 3-5: Inward FDI flows in candidate countries in 2001

Country	Inward FDI (euro million) in 2001	Inward FDI to GDP (%) in 2001	Inward FDI flows in NMS total (%) in 2001	Inward FDI flows per head (euro) in 2001
CY	419	4.1	2.2	552
CZ	5 489	8.6	29.2	533
EE	603	9.8	3.2	441
HU	2 730	4.7	14.5	268
LT	497	3.8	2.6	142
LV	198	2.3	1.1	84
MT	350	8.7	1.9	894
PL	6 377	3.1	33.9	165
SI	486	2.2	2.6	244
SK	1 647	7.2	8.8	306
Total NMS	18 796	4.6	100.0	251
UE-15	*403 824*	*4.6*		*1 068*

Source: Lovino (2003)/Eurostat.

If we look at FDI inflows received by the new EU Member States we notice that in 2001 three countries caught almost 80% of FDI inflows: Poland got the most important part (almost 34%) followed by the Czech Republic (29.2%) and Hungary (14.5%). All the others countries got less than 10% of the whole. Compared to the size of their population Malta has the highest position with 894 EUR per head while three countries are between 400 and 600 EUR, respectively Cyprus with 552 EUR, the Czech Republic with 533 EUR and Estonia with 441 EUR. The poorest position is occupied by Latvia with 84 EUR per head.

Nevertheless if FDI inflows certainly contribute to the growth of a country their effects can strongly vary sectorally and geographically. They are not generally spread homogeneously on the territory of a country. Pavlinek (2004) shows within four countries – the Czech Republic, Hungary, Poland and Slovakia – that during the second half of the 1990s FDI inflows remained highly concentrated in capital cities and other metropolitan areas. FDI in the forms of banking, financial and services types of investments concentrated in the capital cities increasing their primacy. Other big cities were also the target of FDI into the service-related activities but expensive urban areas tend to be less favoured by manufacturing investment. In the Czech Republic, for example, Prag and Brno, the two largest cities, attracted over 60 percent of service-oriented foreign-owned firms but only 24 percent of manufacturing FDI.

3.3.2.5 Currency evolution in new EU Member States

The exchange rate plays a determining role in a country's competitiveness. The choice of the exchange rate level is consequently an important issue. A strong currency or a currency with an underlying tendency to appreciate could favour the development of financial activities in some cities.

The other regions specialised in more traditional activities such as industry or tourism could suffer a lot from such a situation. Moreover these regions could become more vulnerable to plant closures. These questions are important because the level at which future EU members' countries decide to peg their currency or to integrate the Euro will influence during decades their economic development with the risk of provoking more regional disparities and spatial discontinuities.

In order to catch the spatial impact of exchange rate three types of situation are distinguished:

- Country with a more or less stable currency
- Country with currency in appreciation
- Country with currency in depreciation

3.3.3 Scenarios under various financial and monetary constraints

In the Final Report, two scenarios are to be constructed assessing the possible national/regional trajectories of each new EU Member States under different financial and monetary constraints. Here, the Polish case is used as an illustrative example.

The Polish case

- The two main economic specialisations are agriculture and manufacturing.
- The financial system is still bank based but with a relative move to a more finance based system. Market capitalisation to GDP was continually increasing during the 1990s: from 3% in 1994 to 21% in 2000.
- If inward FDI are important in volume. Per head they are less important in comparison with other new EU Member States.
- During the 1990s Polish Zloty knew a strong tendency to revaluate against the Euro in real terms.

3.3.3.1 Scenario A: finance-driven economy, and currency in appreciation

Under the current trends (move to a finance-driven economy, a currency in appreciation,…) a monocentric development could be expected with the development of financial activities in one single dominant financial centre. FDI inflows will be mainly in service-oriented activities and Warsaw will attract most of them. At the same time regions specialised in agriculture or manufacturing will suffer from a lack of – national or foreign – finance and know some difficulty to export due to the strong Zloty.

3.3.3.2 Scenario B: more bank based system and currency in depreciation

In changing financial and monetary conditions (a more bank based system, a lowest Zloty,…) a more diffused and polycentric development could occur in the whole country: agricultural and industrial regions could know a relative autonomous growth while international tourism could develop in cities such as Warsaw, Krakow, Gdansk. A lowest Zloty will favour FDI inflows in industrial regions.

3.3.4 Intermediary conclusion and next steps

If we are able to put in parallel the evolution of some monetary and financial variables with the spatial and economic structures of these different countries some important problems remain. In particular the lack of data at a regional – even at a national-sectoral – scale is a serious problem. In such a situation it is particularly difficult to define more precisely what will be the effects of the enlargement process on regional outcomes. Nevertheless, during the next phase of ESPON 1.1.3 we will complete our statistical analysis with the already existing data.

Next theoretical step will be to construct a typology taking into account both the main features of each country and the evolution of some financial and monetary variables.

Finally the scope of this study will be to formulate as precisely as possible the outcome of the financial and monetary integration on polycentric development. Countries with a rather low currency and a decentralised financial system may encounter a decentralised economic development, needing infrastructure for goods transportation toward EU core markets and passenger transportation to their tourism resorts. On the contrary, countries with rather strong currency and a finance-based system may see the development occurring mainly in their capital city.

3.4 Analysis of spatial association

Timo Hirvinen

3.4.1 Introduction

It is part of the established wisdom in spatial studies that regions with similar development patterns, either positive or negative, tend to locate close to each other. In an integrated Europe, and especially, as a consequence of the EU's recent eastward enlargement, this kind of spatial dependence can be expected to strengthen. Regions become more and more closely connected due to constantly increasing mobility of goods and production factors, as well as through intensifying interregional cooperation among public and private agencies, businesses and institutions. In the EU cohesion policy context, this raises a growing need for analysing the spatial aspects of regional growth, as well as for incorporating the implications of the results into the policy recommendations.

This demonstration aims at measuring spatial patterns of regional disparities across the ESPON space. The focus is on the testing for the presence of spatial dependence in regional developments, and also on the visualisation of local variation. The paper is structured as follows: A brief introduction to the research approach is given first. Then some general empirical evidence on whether, and to what extent, geographical proximity matters in regional developments in ESPON space is presented. Does a region benefit – or suffer – from having prosperous regions as its neighbours, or is the growth in European regions spatially random, without any systematic pattern of spatial dependence and clustering? In the third section, local spatial patterns and types of spatial association are identified by indicating the outliers in the general pattern and by illustrating these spatial instabilities by maps. As a final step, a summary of the results and conclusions are presented.

3.4.2 Spatial autocorrelation of GDP, GDP per capita, and population growth

A number of methods have been proposed to measure spatial aspects of regional disparities. One such method has been developed by the French members of the ESPON 3.1 (Multiscalar territorial analysis/Analysis of deviations). A pilot exercise of the present analysis was based on this approach, and was included in the SIR of ESPON 1.1.3. In order to give new insights into this issue, the following analysis is based on a somewhat different methodology: the Moran I spatial autocorrelation statistic:

$$I = \frac{n}{\sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij}} \cdot \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij} z_i z_j}{\sum_{i=1}^{n} z_i^2}$$

where z_i is the normalised attribute value of the region i, n is the number of regions, and W_{ij} is the spatial weight matrix, where each element w_{ij} represents the nearness between regions i and j.

In general terms, Moran I measures the similarity of attribute values in an area, the degree to which a spatial phenomenon is correlated to itself in space. In other words, it indicates how much two properties – locational similarity and similarity in some other dimension – vary together. The expected value for Moran's I is -1/(n-1) which approaches 0 for a large number of regions. Values of I are in the range from approximately -1 to 1. Positive values imply positive spatial autocorrelation, a tendency towards clustering of similar values. The converse is true for negative values indicating that dissimilar values tend to appear in close association.

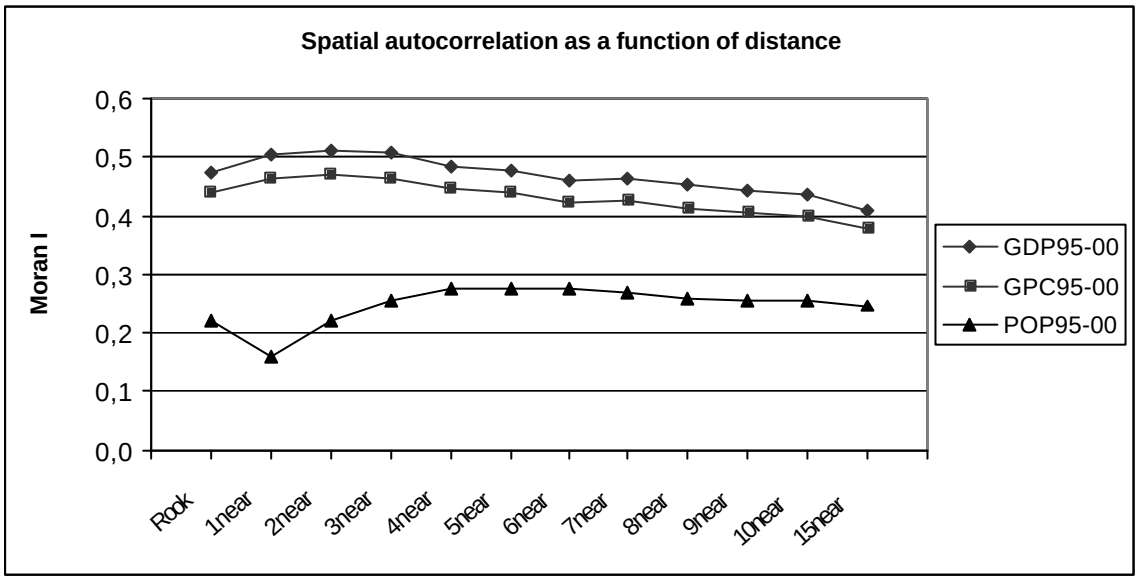
The dataset for this application consists of the following three variables, measured at NUTS3 level in EU27+2:

1. GDP95-00: GDP in purchasing parity standards (Euros), change from 1995 to 2000

2. GPC95-00: GDP per capita, change from 1995 to 2000
3. POP95-00: population change from 1995 to 2000

Figure 3.7 shows the distribution of Moran I statistics for these variables, separated into twelve different binary weights matrices. 'Rook' is a simple contiguity matrix where neighbourhood is defined by a common boundary: i.e. the element w_{ij} in the weights matrix is 1 if regions i and j share a border, and 0 otherwise. The other matrices are based on computation of the k-nearest neighbours so that he distance between the polygon centroids is used as a criterion for nearness and the K regions j that have the smallest distance to region i take on a value of 1 in w_{ij}, and 0 otherwise[7].

Figure 3-7: Spatial dependence in different neighbourhoods, EU27+2



The distributions in Figure 3.7 show a very consistent pattern. As the number of neighbours is increased, an initial increase in the value of Moran I is followed by a slight decrease in the value of spatial autocorrelation. While the results are fairly robust with regard to different specifications of the weights matrix, the highest values are measured in the range from two to seven neighbours. Due to a stochastic element associated with a very small number of neighbours, a weights matrix in the middle of this range – five nearest neighbours – is used as the spatial regime of the neighbourhood effect in this application.

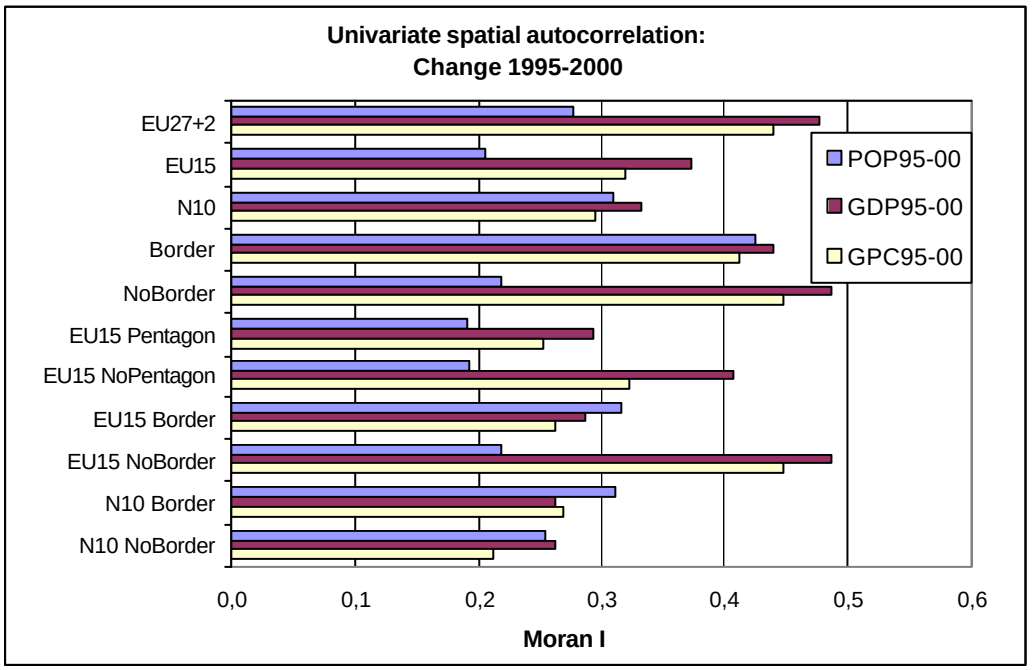
The results for the growth rates of GDP, GDP per capita and population are shown in Figure 3.8. Overall, quite large positive values of Moran I reveal the clustering of similar values among neighbouring NUTS3 regions in Europe. Thus, the hypothesis of spatial independence in regional developments among the regions of the ESPON space has to be rejected.

[7] Without any distance-based cut-off this yields to arbitrary neighbourhoods. To avoid this problem the following eight 'very isolated islands' were excluded from the dataset: ES701, ES702, FR91, FR92, FR93, FR94, PT2, PT3.

A notable feature in Figure 3.8 is that there are significant differences in the values of spatial autocorrelation between the ESPON sub-spaces. The values for the population change also show a somewhat different neighbourhood dependence than those for the GDP and GDP per capita growth. This difference is largest with respect to the border/no border division, in which neighbourhood dependence for the population change seems to be stronger among the border than non-border regions. This result also holds true for the enlargement countries, so it cannot be considered only as a consequence of the EU integration process. This finding clearly contradicts the literature that stresses the importance of national borders in determining the discontinuities in regional developments and population dynamics. Yet it has to be noticed that an opposite and more conventional inter-country pattern exists with regard to the economic growth.

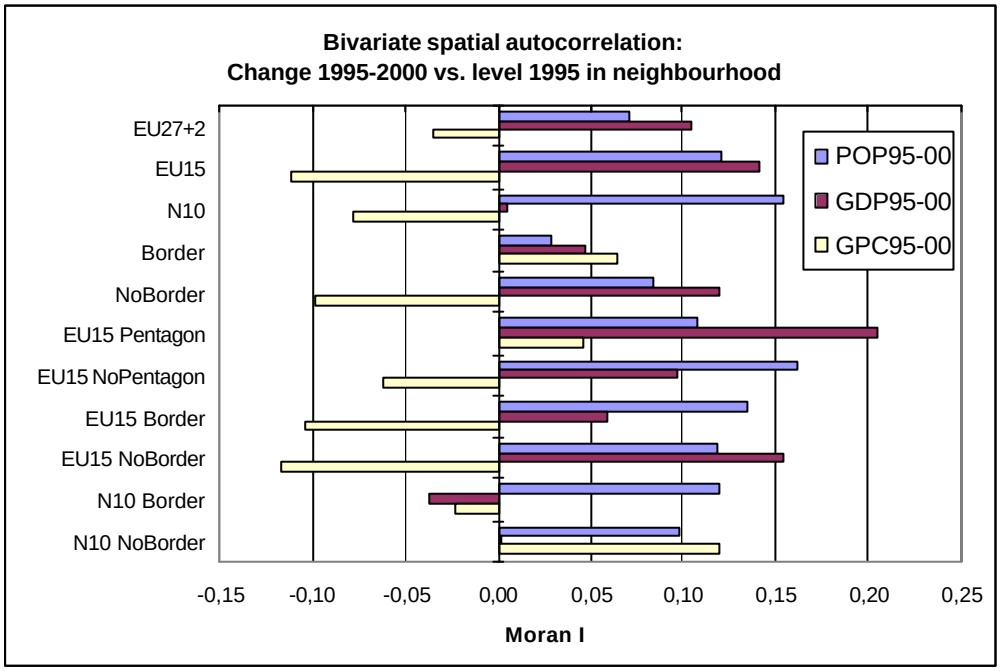
Another interesting finding concerns the weak neighbourhood effect observed within the regions in the EU15 Pentagon. This may indicate a slightly more scattered, or a mosaic-like, spatial pattern occurring in these core regions than seems to exist in the other parts of EU15, and also in the enlargement countries. The result may also be caused by the used spatial autocorrelation measure itself, so that outside the Pentagon, the local concentrations of low and high values dominate the global results and a tendency towards clustering smooth away the substantive regional heterogeneity and discontinuities existing between the different spatial regimes. The third, and the simplest, explanation relates this observation to the differences in the NUTS3 disaggregation levels. In Germany, for example, NUTS3 regions may be too small so that units of observations do not coincide with the functional regions.

Figure 3-8: Spatial dependence – GDP, GDP per capita and population change 1995-2000



In Figure 3.8, the change of a variable in a region is related to the 1995 level of that variable at the neighbouring locations. This bivariate measure of spatial autocorrelation highlights the space-time correlation, i.e. how strong is the spatial clustering effect in time so that regions with poor neighbours tend to grow slow rate, and vice versa. Particularly, in the case of positive neighbourhood dependence, this bivariate spatial autocorrelation statistic is closely related to the concept of convergence. High and positive values indicate that highest growth rates occur in regions surrounded by rich regions, implying increasing income disparities and divergence. Negative values, in turn, indicate a tendency towards convergence: i.e. regions with poor neighbours tend to realise higher growth rates than the ones with rich neighbourhoods.

Figure 3-9: Spatial dependence – change 1995-00 vs. level 1995



Not surprisingly, the results in Figure 3.9 indicate a consistent positive bivariate spatial autocorrelation for population change. Thus, the population growth in European regions seems to be positively correlated to the initial levels and the growth rates in neighbouring regions. The spatial pattern of the GDP is slightly more dispersed, while in general, the values do not reveal any empirical support for the economic convergence. Concerning GDP per capita, however, negative values of this measure are observed in eight cases out of eleven (EU27+2, EU15, N10, NoBorder, EU15 NoPentagon, EU15 Border, EU15 NoBorder, N10 Border). From the viewpoint of Europeanwide cohesion and convergence this is clearly a positive result: the more negative the value of this bivariate autocorrelation measure, the higher the growth rates of GDP per capita in the regions surrounded by regions with low GDP per capita in 1995.

3.4.3 Clusters of regions and spatial outliers

The decomposition of the global Moran I into the contributions of individual regions provides a region-specific measure to illustrate to what extent each region in the data set is surrounded by regions with high or low values. Significant values of this local Moran can be used to identify atypical regions (hot and cold spots), and areas where there appears to be a high tendency for clustering.

When decomposed in this way, a local Moran statistic acts like a 'spatial smoother', indicating two forms of spatial associations. Positive forms of spatial associations are observed in the following areas:

1. High-High, i.e. a high rate in a region surrounded by high values of the weighted average rate of the neighbouring regions, and
2. Low-Low, i.e. a low rate in a region surrounded by low values of the weighted average rate of the neighbouring region.

Two forms of negative spatial associations are:

3. Low-High, i.e. a low rate in a region surrounded by high values of the weighted average rate of the neighbouring regions, and
4. High-Low, i.e. a high rate in a region surrounded by low values of the weighted average rate of the neighbouring regions.

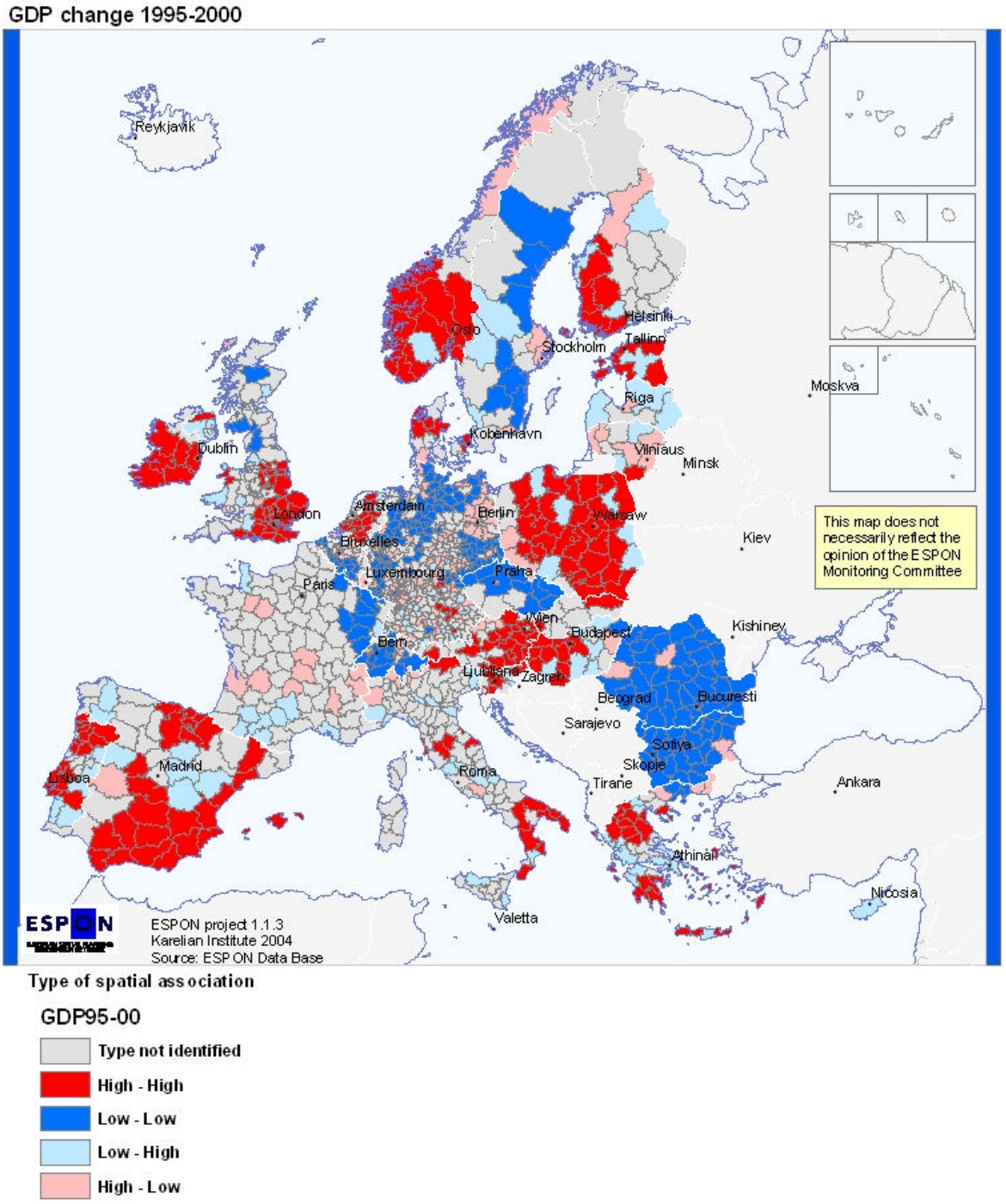
Since the positive local associations tend to dominate negative ones in the case of positive global autocorrelation (i.e. in univariate cases), the latter types are identified by using a somewhat lower criterion. In addition, because the results of local Moran are rather sensitive to the choice of the significance level and the choice of spatial weights, the maps are based on compiled information from three weights matrices (3-, 5-, and 7-nearest neighbours) as follows:

1. GDP95-00 and GPC95-00: Univariate local Moran I
    - Positive associations: mean significance < 0.2, the same type of spatial association identified in all three weights matrices
    - Negative associations: a type of spatial association identified in at least one weights matrix
2. POP95-00: Univariate local Moran I
    - Positive associations: mean significance < 0.2, the same type of spatial association identified in all three weights matrices
    - Negative associations: the same type of spatial association identified in all three weights matrices

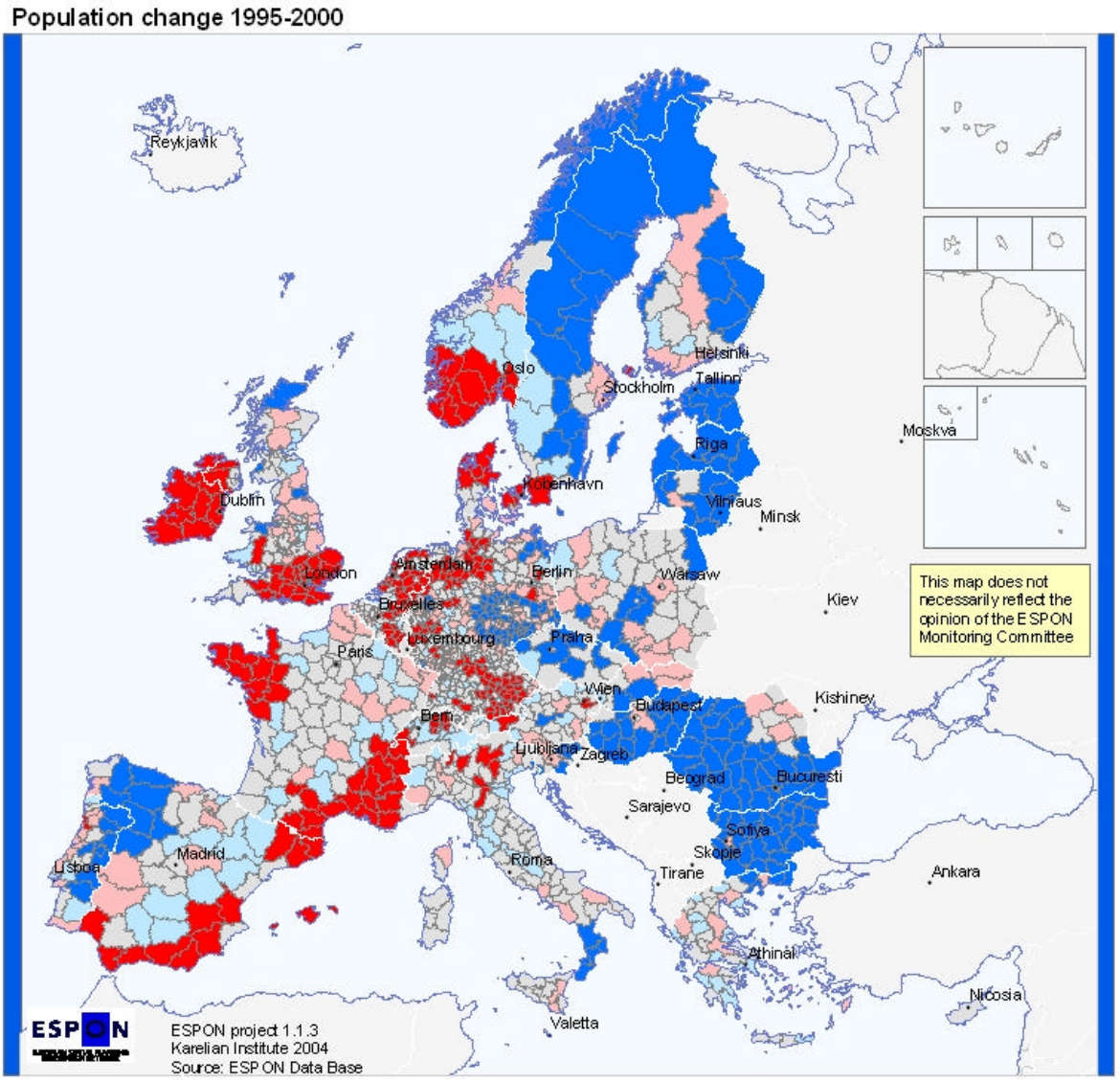
3. GPC95-00 vs. level 1995: Bivariate local Moran I

- Positive and negative associations: mean significance < 0.3, the same type of spatial association identified in all three weights matrices

Map 3-3: Spatial association of GDP growth 1995-2000



Map 3-4: Spatial association of population growth 1995-2000



Type of spatial association

POP95-00

- Type not identified
- High - High
- Low - Low
- Low - High
- High - Low

Map 3-5: Spatial association between GDP per capita growth 1995-2000 and GDP per capita 1995

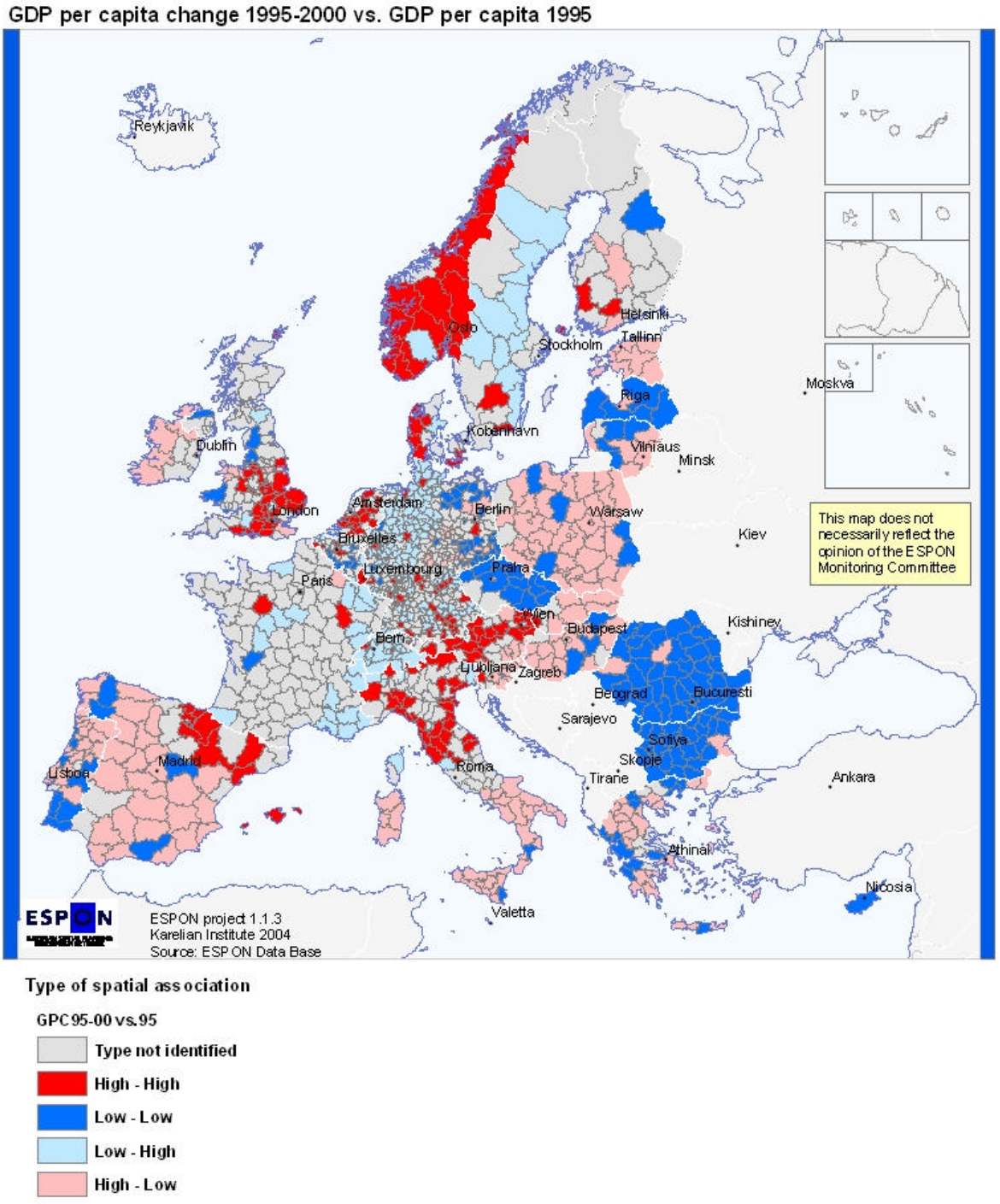


Table 3.6 lists the distribution of EU27+2 and N10 regions according to the type of spatial association. It reveals high proportion of high-high and low-low clustering types of regions in cases of positive global spatial autocorrelation: In spite of a higher criterion used for both the GDP and population change (see, Maps 3.3 and 3.4), about 40 percent of the regions in the EU27+2 belong to these categories. In particular, low development seems to appear in distinctive homogenous zones: in addition to the weak performance in the regions of Bulgaria and Romania, significant low-low concentrations can be found, for example, in the northern peripheries, Czech Republic, and some parts of Germany.

Table 3-6: Regions by type of spatial association in EU 27+2, EU15 and N10

		GDP95-00		POP95-00		GPC95-00 vs. GPC 1995	
		N	%	N	%	N	%
EU 27+2	High-High	266	20,1	249	18,8	184	13,9
	Low-Low	280	21,2	259	19,6	177	13,4
	Low-High	164	12,4	156	11,8	252	19,1
	High-Low	157	11,9	116	8,8	250	18,9
	Type not identified	454	34,4	541	41,0	458	34,7
	Total	1321	100	1321	100	1321	100
EU15	High-High	197	18,2	231	21,3	163	15,0
	Low-Low	192	17,7	142	13,1	81	7,5
	Low-High	141	13,0	142	13,1	232	21,4
	High-Low	135	12,4	97	8,9	169	15,6
	Type not identified	420	38,7	473	43,6	440	40,6
	Total	1085	100	1085	100	1085	100
N10	High-High	56	46,3	0	0,0	2	1,7
	Low-Low	11	9,1	53	43,8	29	24,0
	Low-High	21	17,4	4	3,3	0	0,0
	High-Low	10	8,3	13	10,7	78	64,5
	Type not identified	23	19,0	51	42,1	12	9,9
	Total	121	100	121	100	121	100

With respect to the average change in population, the clusters represent the attractiveness of coastal regions and Pentagon, vis-à-vis inland peripheries and other less accessible areas. In this respect there is also a clear east-west divide: none of the regions in N10 stand for this high-high category. In the case of GDP change, the spatial pattern is more diverse, and concentrations of high-high types of regions can be found around the capitals in the European north, in the triangle of Wien/Bratislava - Budapest - Trieste, and in Catalonia and southern Spain. Because of a strong high development cluster in Poland, almost half of the regions in N10 also belong to this high-high type of local spatial association.

Map 3.5 illustrates the spatial distribution of the earlier finding that – at least with respect to the EU 27+2 average – regions with poor neighbours in 1995 tended to grow faster in the period of 1995-2000. As it can be seen, the spatial pattern is not homogenous. The light red areas, representing convergence, are quite unevenly distributed across the European space. In fact, the convergence in terms of this particular bivariate spatial autocorrelation measure seems to have taken place only in two macroregions: in parts of the Mediterranean EU15 cohesion countries in the south, and among the core regions in central European N10 countries (Czech Republic excluded). In other European peripheries or Objective 1 regions, excluding Ireland and Estonia, this illustration reveals no evidence for the systematic 'catch-up' in terms of GDP per capita.

The distribution of spatial outliers – or so called 'hot and cold spots' – is, of course, geographically very scattered. Overall, and as a common characteristic across the ESPON space, locations of these low-high and high-low -regions reflect the dominant role of capitals, largest cities and some industrial centres. This can be seen in Table 3.7 that presents 'the top ten regions' in the N10 countries in terms of the most significant negative local spatial association (univariate case) according to the type high-low.

The policy implications from this listing are not very clear. As these positive outliers have a particular high potential for economic growth, they may play a prominent role in producing positive growth impulses to the benefit of regions in their geographical neighbourhood. The values of spatial dependence, however, imply that the local spillover effects and knowledge transfers originating from these 'potential nodes of polycentric development' were at least in 1995-2000, in fact, significantly weak. Since the links between the observable spatial heterogeneity and the spatial boundaries of market processes are complex, this issue remains a task of future empirical research: Is the outstanding favourable growth potential in some N10 regions somehow related to the ongoing integration process, does it reflect the local polarisation of the economies in Europe, or does it just reflect the mismatch between the administrative and functional borders?

Table 3-7: The most significant 'hot spot' -regions (type high-low) in N10

POP95-00		**GDP95-00**		**GPC95-00**	
LT007	Taurages	CZ01	Praha	CZ01	Praha
HU012	Pest	LV001	Riga	HU063	Szabolcs-Szatmar-Bereg
PL042	Zielenogórski	HU061	Hajdu-Bihar	HU061	Hajdu-Bihar
PL0C1	Pólnocnoslaski	LT003	Klapeidos	LV001	Riga
PL073	Warzawski	PL042	Zielenogórski	LT003	Klaipedos
SI00E	Osrednjeslovenska	LT008	Telsiu	PL042	Zielenogórski
PL013	Wroclavski	LT009	Utenos		
SK042	Kosický Kraj	PL011	Jeleniogórsko-Walbezyski		
PL061	Krakowsko-Tarnowski	LT00A	Vilnaus		
SI009	Gorenjska	LT002	Kauno		

3.4.4 Key findings and implications

In this application, a divergence in growth processes is observed in terms of NUTS3 regions. The size of these, however, is different across countries, and they may not represent the geographical units in which spatial clusters evolve and spatial association prevails. In addition, commuting is not taken into account. This tends to overestimate the GDP per capita measure in centres, and lead to systematically biased estimates of spatial association between the commuting centres and their neighbourhoods. These limitations with the data, of course, do not invalidate the study but clarify the need for care in interpreting the results.

The results of this exercise emphasise the importance of spatial proximity with respect to the evolution of regional disparities across European space. For all the three measures of regional growth, a positive univariate spatial autocorrelation is detected. This means that growth rates of regions are characterised by neighbourhood dependence: the more a region is surrounded by regions with positive dynamics, the higher is its own growth rate. This clearly manifests a need both for a systematic analysis of the role of spatial factors in economic growth, and for considering its implications for the EU cohesion policy.

Regarding the specific spatial patterns of regional growth processes in Europe, the key findings can be summarised in following three points:

- Firstly, there are clear disparities in spatial patterns across European space. Most countries and parts of Europe seem form clear macro clusters of economic performance. However, when we turn to look at regions in the Pentagon, no systematic tendencies for clustering – at least in terms of the NUTS3 – are visible. This mosaic-like spatial pattern in the Pentagon can be considered as polycentric: the existing spatial regimes, both positive and negative developments, are territorially scattered and relatively small in their size.
- Secondly, the results indicate some evidence for the cohesion at the macro level. The regions surrounded by regions with a low GDP per capita seem to grow faster than regions with more prosperous neighbours. This pattern is also characterised by clusters and country-effects, implying the existence of different spatial regimes between and within the cohesion countries and the EU's Objective 1 regions.
- Thirdly, the distribution of spatial outliers reflects a strong agglomeration effect. Developments in the largest urban areas and capital regions within countries are more positive than in the other parts of countries. This effect seems to be particularly strong in the new member states. The reasons for this are, of course, manifold and obviously, country-specific, although this result may also indicate some kind of centre-periphery lag. During the enlargement process and transition, the largest cities have benefited most from the increased economic interaction with the EU, and maybe also from the preaccession aid. The first five-year period of the enlarged EU would be interesting to examine: whether this divide is continuing or some kind of 'catch up' process is taking place.

4 Typologies of Needs

4.1 Regional Specialisation and Geographic Concentration in the Enlarged EU.

Elena Besussi

4.1.1 Vulnerability of regions due to increasing economic integration

The purpose of this analysis is to address the growing concern about the potential vulnerability of European regions due to increasing economic integration and globalisation. The main worry is that the processes of integration and globalisation may affect the degree of regional specialisation and the geographic concentration of economic activities.

If regional specialisation increases, industry-specific shocks may become region-specific shocks and sector-specific policies might become region-specific policies making regions more vulnerable. On the other hand, higher specialisation and greater concentration might lead to increased productivity via increasing economies of scale. Regional performance is also related to economic specialisation, even though the nature of this relationship changes with the economic sector and therefore caution should be used in making inferences between the positive or negative impacts of regional specialisation.

A common idea in the studies on the impacts of integration on regional specialisation is that the design of trade agreements and of infrastructure networks (as investigated in chapter 5 of this report) shapes the location advantages in terms of [accessibility to] markets. This has occurred in the case of NAFTA area where integration has led to an increasing advantage for border regions compared to core areas (such as Mexico City) because of their access to the US markets. In Europe, economic activities with large economies of scale have become more concentrated (measured via GINI coefficients) in the period 1980/90 (Brülhart and Torstensson, 1996).

Signals of increasing economic integration between new member states and the rest of the EU via increasing trade and foreign direct investments have been widely investigated in the literature (Raagmaa, 1996, for Estonia, Traistaru, 2002a, for Romania, Molle, 1997, for the EU15, Altomonte and Resmini, 1999, and Traistaru, 2002b for the Accession Countries). The impact of Structural and Pre-Accession Funds on regional performance and specialisation are also explored in the ESPON Programme (Project 2.2.2).

The analysis that follows is based the assumption that processes of integration and regional change are ongoing in the enlarged EU and suggests territorial typologies based on patterns and trends of regional economic structure. The objective is therefore not to provide further evidence of these processes but to identify which regions, under these circumstances, might be at risk of economic decline or potential success and to provide a framework for policy targeting.

4.1.2 Measuring Specialisation and Concentration

Regional specialisation and geographic concentration are usually analysed in terms of industrial production structures and industrial trade patterns. In that context the analysis is based on data on employment and GDP as well as on the amount of traded goods for the different manufacturing industries (in the European context these are usually the 22 two-digit NACE sectors); countries or regions are the standard geographic levels of reference. Many indicators have been developed to quantify these trends and a review is available in Aiginger (1999). Within that framework the following definitions apply:

- specialisation as the (distribution of the) shares of the industries in a specific country or region;
- concentration as the (distribution of the) shares of the regions or countries) in an individual industry.

Here we have adopted (and adapted) these definitions and a subset of the available indicators to the analysis of data on regional employment aggregated into three main economic sectors: agriculture (sectors A and B of the NACE classification), manufacturing (sectors C to F) and services (sectors G to P) for the period 1995 to 2001 for 260 NUTS2 regions (Bulgaria and Switzerland are excluded because of data limitations).

In the case of geographic concentration we have supplemented the selected regional indicators with "system-level" metrics that provide insights into the trends and patterns of the three different geographic systems: the EU29 (again, excluding Bulgaria and Switzerland), the EU15 and EU12. Table 4-1 provides a list of the indicators used.

Table 4-1: Indicators used in the analysis of regional specialisation and geographic concentration

E = employment s = share i = industry j = region	
Regional Specialisation	**Geographic concentration**
"Absolute" share: $s_{ij}^{s} = \frac{E_{ij}}{\sum_i E_{ij}}$ Herfindahl index of regional specialisation: $H_j^s = \sum_i (s_{ij}^s)^2$	"Relative" share: $s_{ij}^{c} = \frac{E_{ij}}{\sum_j E_{ij}}$ Aggregate percentage employment growth by sector Degree of concentration (measured as the slope of the rank-size curve) Change in the degree of concentration Ratio between the numbers of regions that have grown or declined

In the following section we are presenting the results of the analysis:

- regional specialisation describes changes occurring within regions and how they relate to regional performance
- geographic concentration describes changes occurring between regions and at the wider geographic scales in terms of trends towards concentration or dispersion.

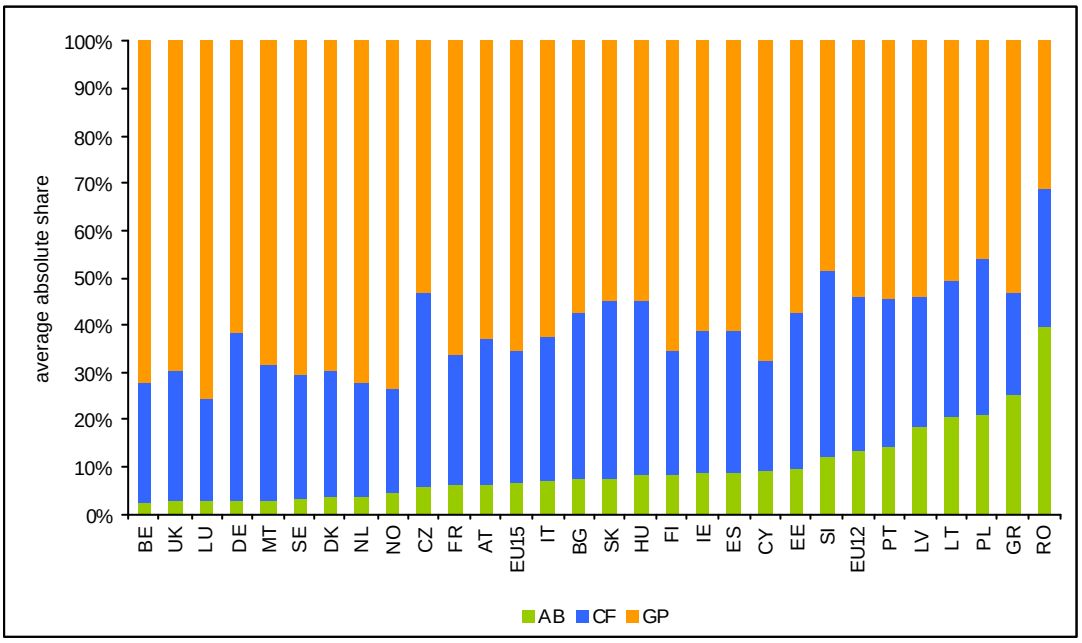
4.1.3 Regional Specialisation

To introduce the analysis on patterns of regional specialisation it is useful to provide an overall picture of the situations at the European level in terms of employment shares in the three economic sectors.

Figure 4-1 shows how most of the EU12 have relatively high shares of employment in the primary sectors with lower-than-average shares in the service activities[1], whereas in most of the EU15, services dominates the regional employment structure. Greece and Portugal are the "old" member states which are more similar to the EU12 average and Cyprus, Malta and Hungary are closer to the EU15 model.

These structures are all undergoing a fast transition characterised by a shift towards the service sectors. At the EU scale, against a 4.5 percent aggregate employment growth 1995-2001, the service sectors have increased by 7.7 percent; at the EU15 scale aggregate and service sector growths amounts respectively to 6 and 8 percent and at the EU12 to percent and percent. The other two sectors considered show either decline or stability.

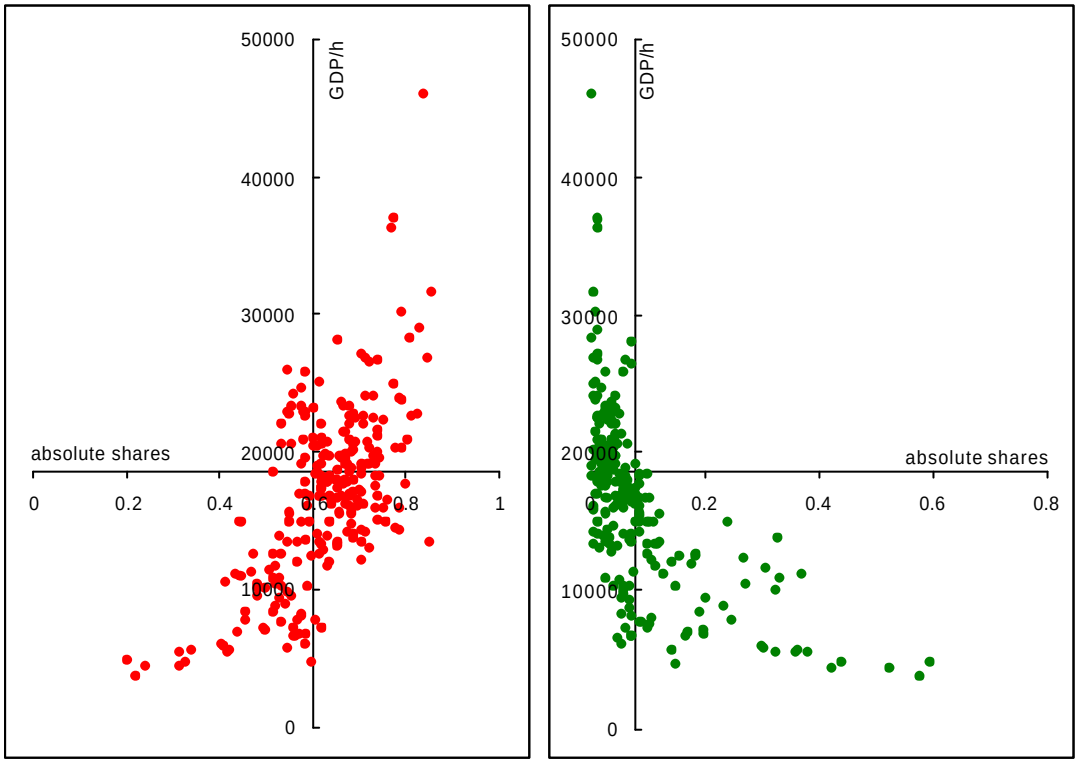
Figure 4-1: Average absolute shares by country, EU12 and EU15 and by sector in 1995



[1] Because of the economic classification used in the analysis, the service sector include both base and non-base services. However these two sub-sectors have different growth patterns and dynamics: the latter can reasonably be assimilated to administration and public services and therefore is linked to population distribution patterns whereas the former tends to have higher levels of location mobility.

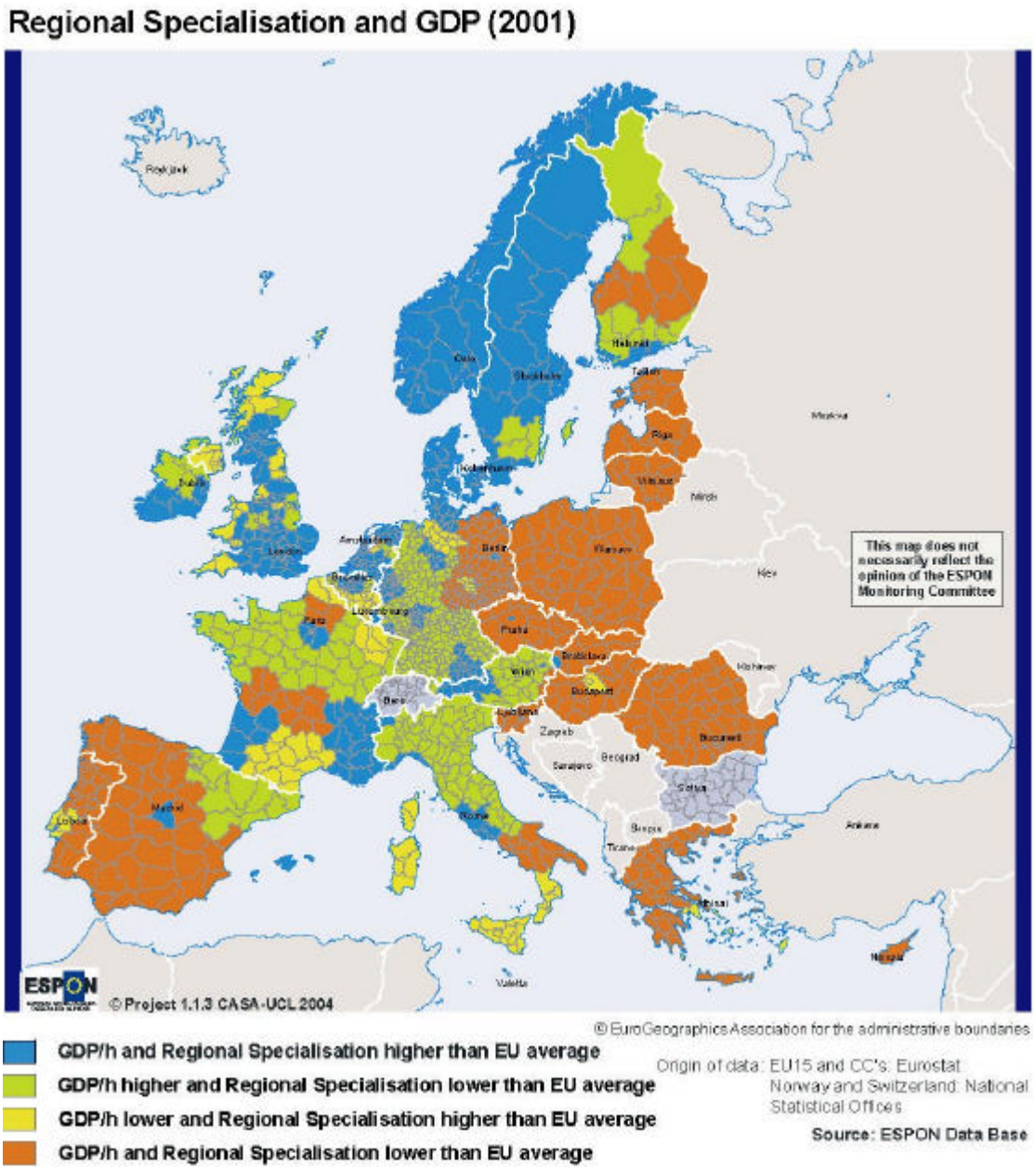
At the regional (NUTS2 level) the results show that higher shares in the service sectors have a strong and positive correlation with higher levels of GDP per capita but for the agriculture sector (and, to a lower degree, the manufacturing sectors) this relationship is reversed (Figure 4-2). There is however no significant relation between absolute shares (in any economic sector) and the size of the NUTS2 regions measured either in terms of sector or total employment.

Figure 4-2: Correlation between GDP/h and employment shares in services (left) and agriculture (right). Axes cross at average values for both indicators



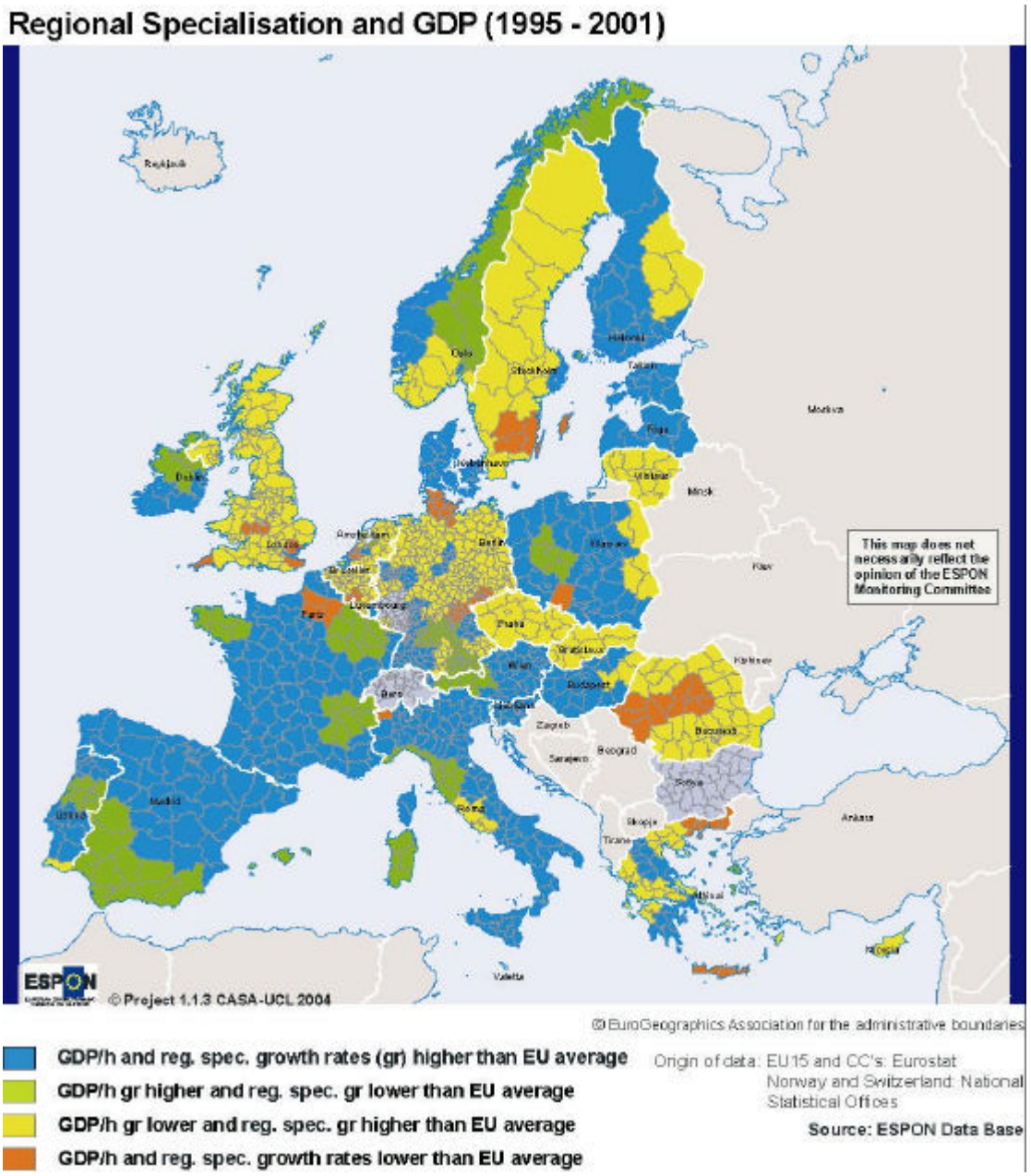
Map 4-1 shows a preliminary territorial typology based on each region's positions relative to EU averages in GDP/h and overall regional specialisation (Herfindahl index). The map shows a significant core/periphery pattern.

Map 4-1: Typologies of regional specialisation and GDP per capita - 2001 (EU average 18,900€ Purchasing Power Standards per capita)



With regards to trends (measured as yearly growth rates) there is no significant correlation between neither size nor change in size (measured both as employment and GDP) and change in the degree of specialisation. This absence of statistical relation however still leaves room for reflecting around the fact that there are regions which are specialising and increasing their GDP/h, regions where GDP/h is growing in a context of de-specialisation and regions where above average growth in specialisation is not accompanied by above average growth in GDP/. Map 4-2 shows how these regional typologies are distributed across the ESPON space.

Map 4-2: Typologies based on trends of regional specialisation and GDP per capita growth, 1995 - 2001 (EU average compound GDP/h growth rate = 1.1)



These analyses and the associated typologies should not be considered a substitute for a more rigorous convergence analysis (see chapter 3.2). The typology presented are nonetheless useful to reveal patterns where regions characterised by low specialisation and GDP (in Spain and Poland, for instance) are experiencing higher GDP/h growth rates and faster specialisation growth than the EU average while for most of the UK these indicators are reversed. These realities call for the use of caution in the evaluation of policies: *not all regions will respond equally to policies that promote specialisation or differentiation of the economic structure.*

4.1.4 Geographic concentration

The role of the analysis of geographic concentration within the context of the ESPON 1.1.3 project is to measure and map the degree and trends of concentration/dispersion occurring in the different economic sectors and to evaluate differences in these structures between three geographical systems: the ESPON space, the EU15 states and the EU12 states.

This analysis therefore deviates from the traditional methods of study for geographic concentration whose main focus is the performance of the individual industry or sector.

To support our analysis we have identified four dimensions according to which the geographic systems/economic sectors can be measured.

Dimension 1: Percentage growth of the sector aggregated at the reference geographic system for reference time period (1995-2001). This dimension gives information on the change in the overall "size" of the systems and whether these are contracting or expanding.

Dimension 2: slope of the linear log-log graph of the rank size distribution where size is measured as regional employment. This dimension describe the degree of concentration / dispersion of a geographic systems. If the value of the slope is near –1, the systems is known to be behave according to the Zipf's Law. It is useful to note that, according to the rank-size rule, a system that is concentrating, often implies that the "small" regions are becoming smaller and the big are becoming bigger. We have therefore supplemented this analysis with charts that plots regions according to sectoral employment size and employment change over the reference period to improve the description of concentration/deconcentration processes..

Dimension 3: Absolute change (1995-2001) in the slope of the rank-size distribution (as described above). It provides insight into the trends towards concentration/dispersion in the different systems. A negative change means an increase in the slope and therefore an increase in concentration.

Dimension 4: "Growth ratio", that is the ratio between the numbers of regions that have grown or declined (in terms of absolute sector employment) in the reference period (1995-2001). Alternatively, the dimension could be based on the change in the "relative" share s_{ij}^{c} as described in Table 4-1.This dimension provides additional information on the internal instabilities of the systems. As we will see, there are systems that appear "static" according to dimensions 1 and 3, whereas dimension 4 shows underlying regional changes.

Table 4-2 lists the values for these indicators in the three geographic systems (ESPON space, EU15, EU12) and for the three main economic sectors.

Table 4-2: The four dimensions for the analysis of geographic concentration

	D1	D2	D3	D4 (absolute change)
Primary sectors				
ESPON space	-3%	-1.2	-0.03	35% / 65%
EU15	-5%	-0.9	-0.03	35% / 65%
EU12	-1.2%	-1.4	-0.1	40% / 60%
Secondary sectors				
ESPON space	-0.3%	-0.7	0	50% / 50%
EU15	2%	-0.8	0	50% / 50%
EU12	-6.7%	-0.5	+0.05	30% / 70%
Service sectors				
ESPON space	+7.7%	-0.8	-0.02	80% / 20%
EU15	+8%	-0.8	0	85% / 15%
EU12	+6%	-0.4	-0.02	60% / 40%

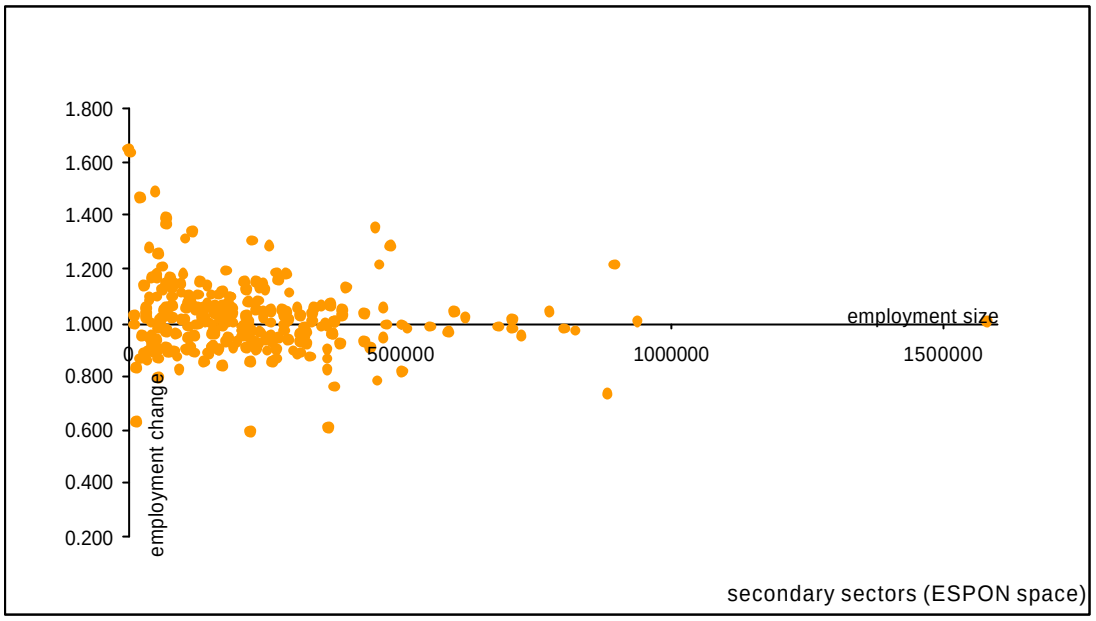
The comparative analysis of the three systems and the three sectors according to these four dimensions has identified 5 typologies of systems.

Case 1 (applies to the ESPON space and the EU15 and to the secondary sectors).

D1 = 0%; D2 = -0.8%; D3 = 0; D4 = 50/50

These systems have not experienced any significant growth or structural change in the last five years (D1 and D3) but according to D4 during this period half of the regions has increased its total employment whereas the remaining half have declined. These changes have mainly occurred in the small and medium regions because any significant change in the largest ones would have been reflected in a change in the degree of concentration. Growth rates are ranging from 0.6 to 1.6 (where 1.0 means no growth). These movements of growth and decline compensate each other to keep the systems in an overall static state.

Figure 4-3: Correlation between employment change and size in the service sectors across the ESPON space



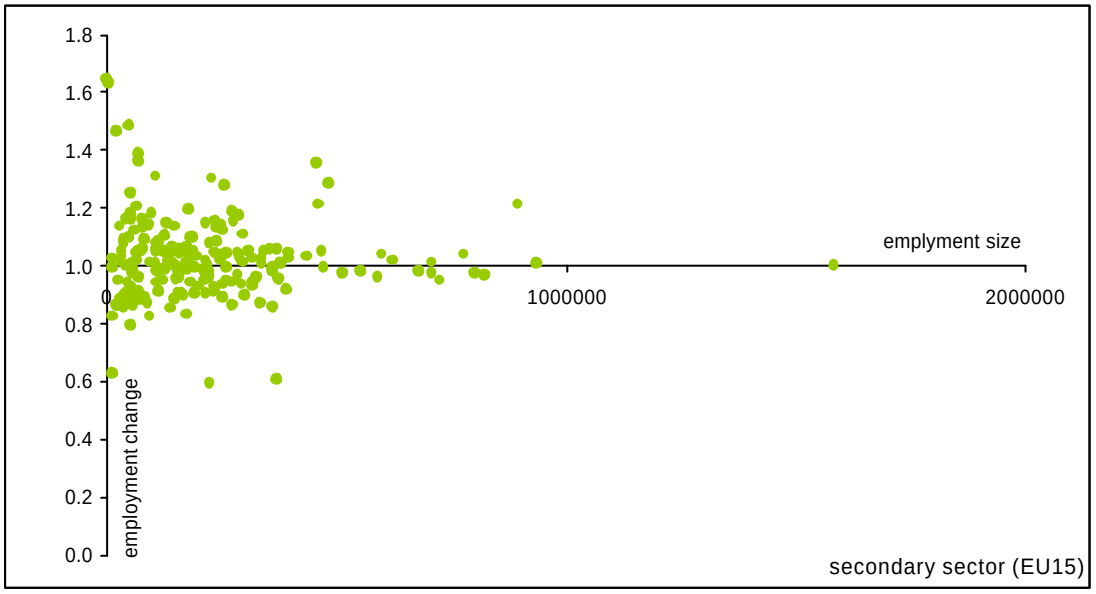
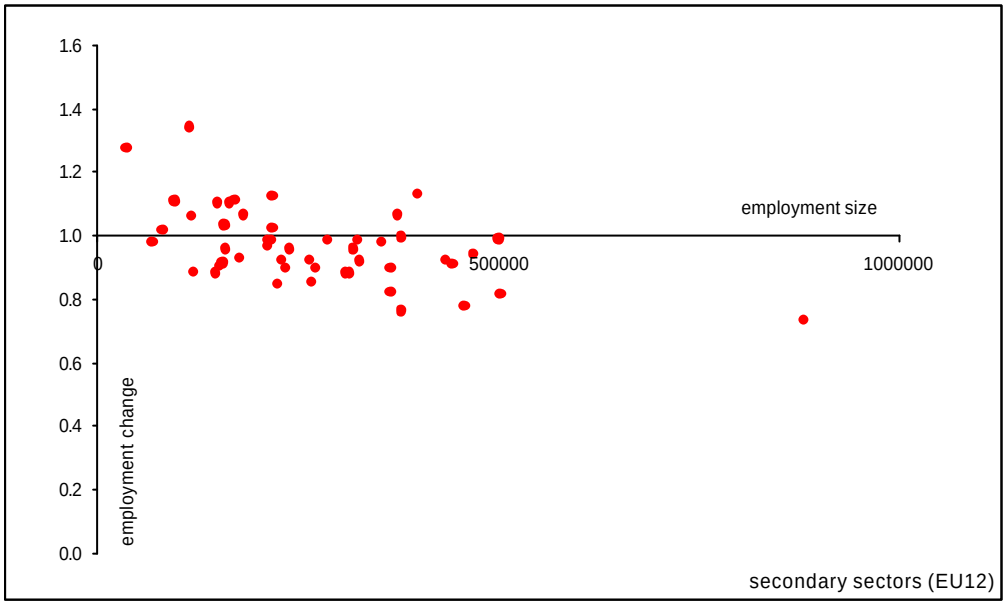


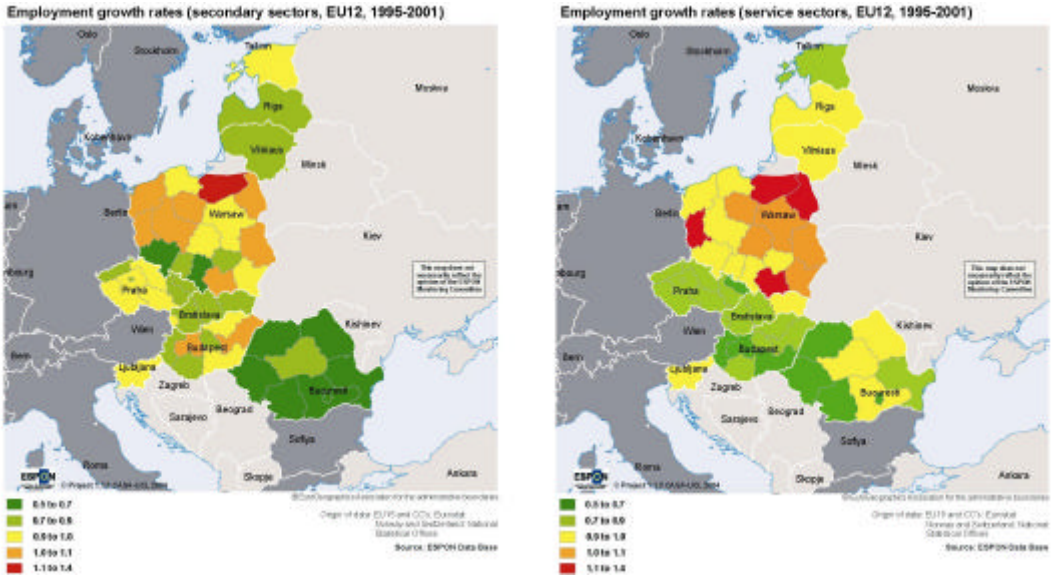
Figure 4-4: Correlation between employment change and size in the service sectors across the EU15

Case 2 (applies to the EU12 and to the secondary sectors).
D1 = -7%; D2 = -0.4%; D3 = +0.05; D4 = 30/70

This is a system that is at the same time declining and deconcentarting. As shown in Figure 4-3, the largest regions (in terms of sector employment) are the ones with the highest decline rates while the smallest have grown up to 40% in six years. However big these increases might be they do not compensate the loss of the largest regions and the system is declining. Because sector employment is used as a measure of size, small should not be interpreted as peripheral. Map 4-3 shows a detail for the EU12 of the regional growth rates for the secondary sectors.

Figure 4-5: Correlation between employment change and size in the service sectors across the EU12





Map 4-3: Employment growth rates for the period 1995-2001 in the new member states in the secondary sectors (left, NACE sectors C to F) and service sectors (right, NACE sectors G to P)

Case 3 (applies to the ESPON space and the EU15 and to the service sectors).

D1 = 7-8%; D2 = -0.8%; D3 = 0; D4 = 80/20

These systems are significantly growing but are not concentrating more than what they already are. Most of the regions have experienced growth and only few (20%) haven't. The latter are mainly the largest regions in the systems. The systems are therefore static "at the top" and keeping their structures in a context of the overall growth.

Figure 4-6: Correlation between employment change and size in the service sectors across the ESPON space

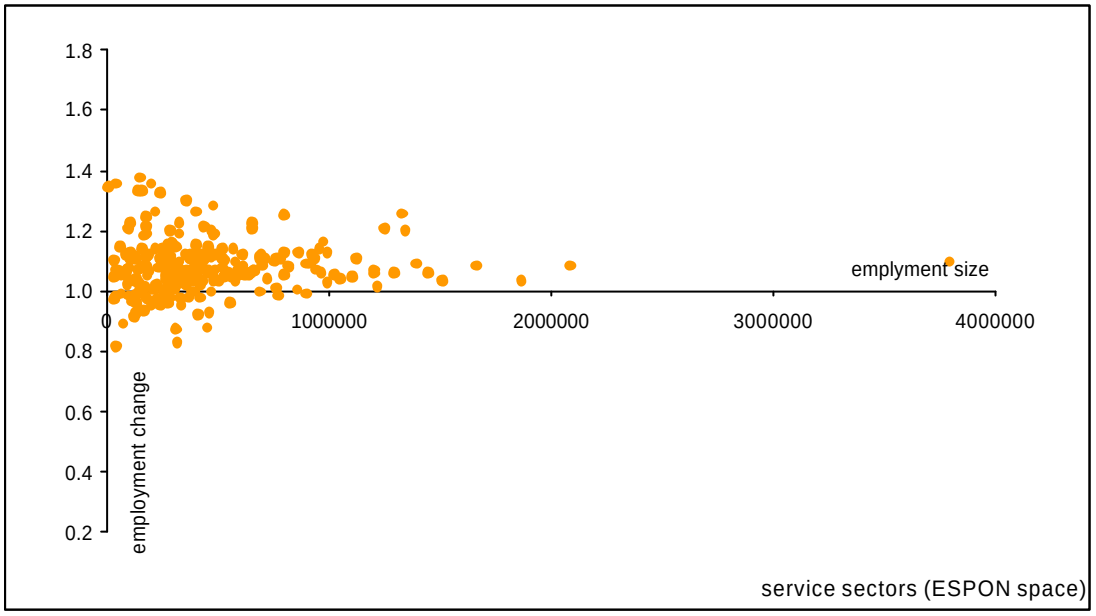
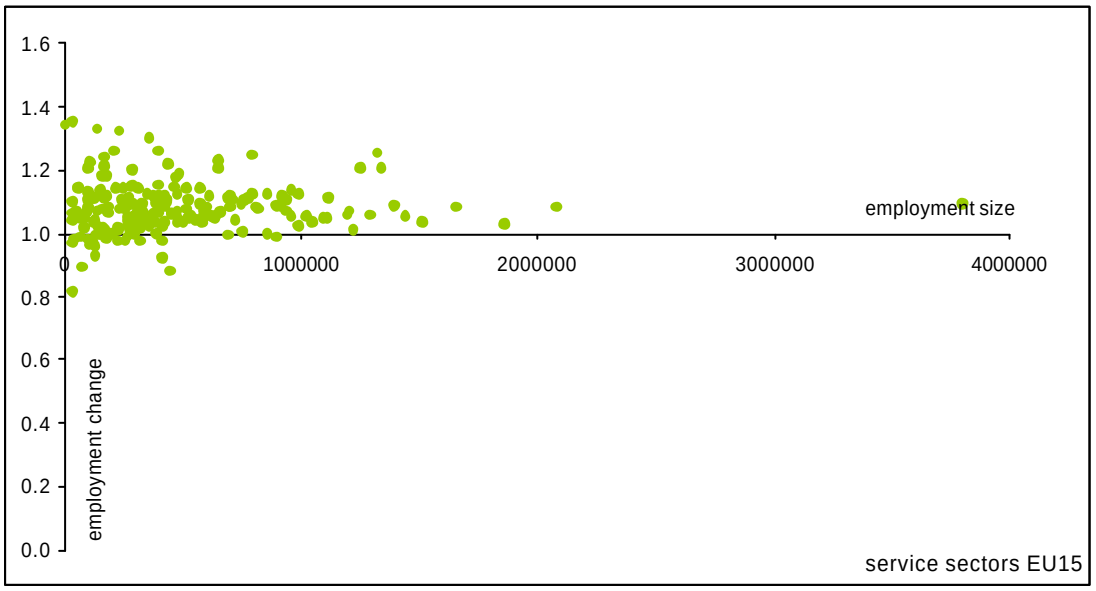


Figure 4-7: Correlation between employment change and size in the service sectors across the EU15



Case 4 (applies to the EU12 and to the service sectors).

D1 = 6%; D2 = -0.4%; D3 = -0.02; D4 = 60/40

This case is very similar to the two previous systems but because the system starts from a decentralised structure and there is a minor shift towards more concentration, the regions that are growing are the largest and the smallest in the system (with the large growing slightly more than the small ones) and the ones declining are the medium sized ones.

Case 5 (applies to all the geographic systems and to the primary sectors).

D1 = -1% to -5%; D2 = -1 to –1.4; D3 = -0.03 to –0.1; D4 = 35/65

These systems have a high degree of concentration and trends show that this concentration is increasing. The trend towards concentration is particularly strong for the EU12. Since the systems are also losing overall employment and therefore contracting, in order to produce the increase in concentration, decline is occurring in the smallest regions and growth in the biggest. While at the ESPON space scale the "largest" regions (measured by the "relative" shares of sector employment) are in the EU12 (mainly Romania and Poland) and the rest of the regions appear to have low shares, by separating the two systems, the regions of southern Spain and Italy, as well as the north of Greece and Portugal emerge as the leading regions in the sectors. These patterns however are more easily evaluated when these indicators are mapped (Map 4-4 and Map 4-5) rather than plotted (Figure 4-6and Figure 4-7).

Figure 4-8: Correlation between employment change and size in the primary sectors across the EU15

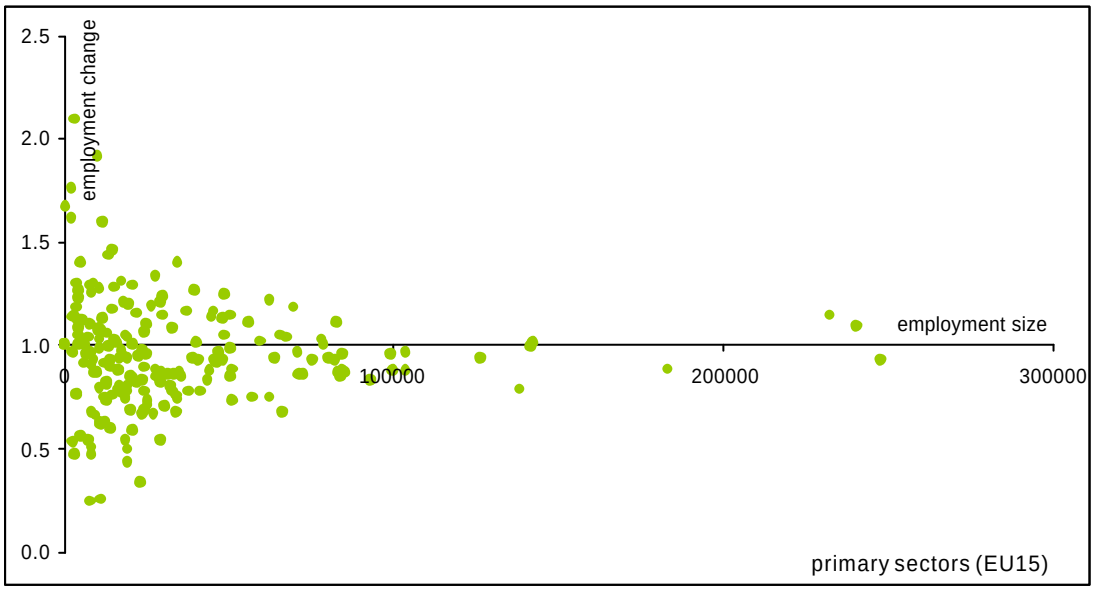
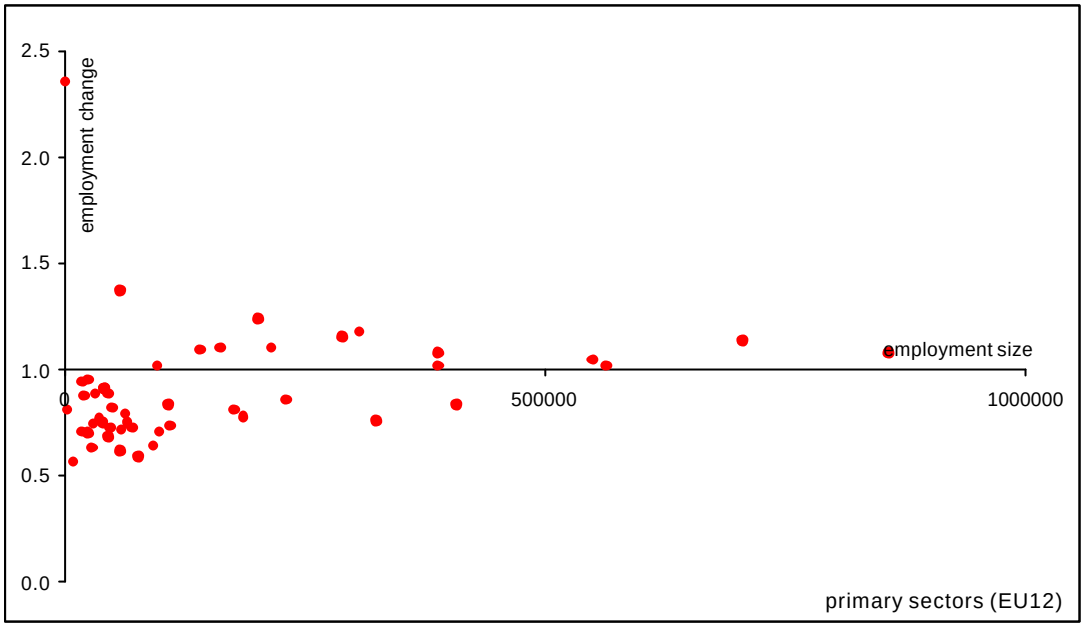
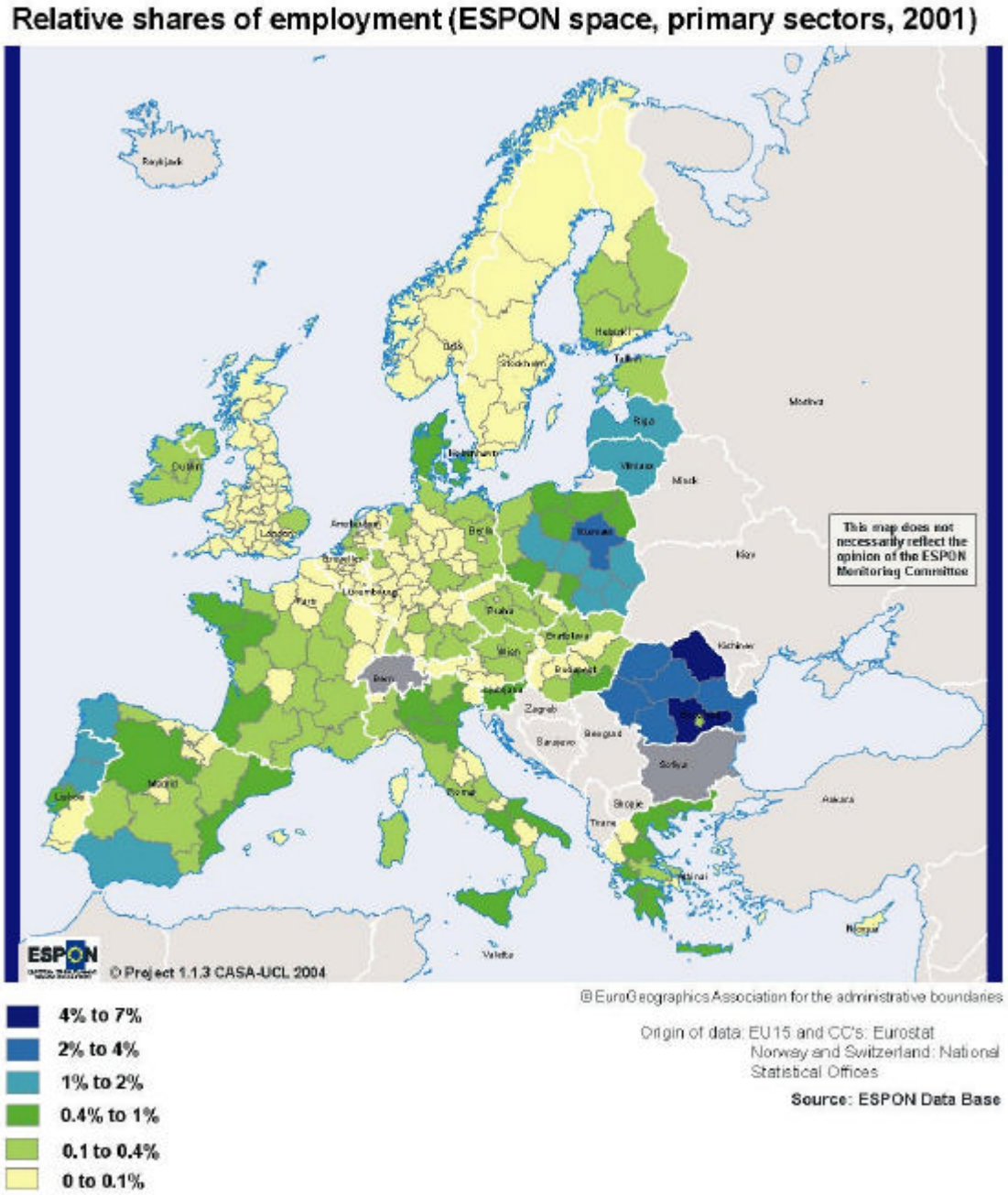


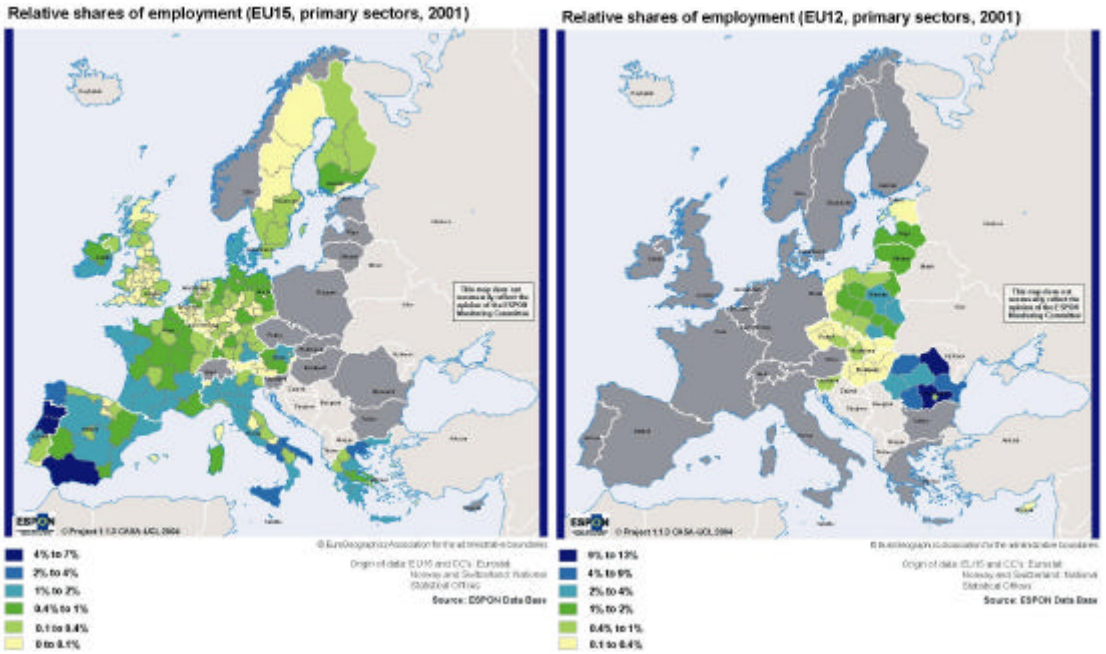
Figure 4-9: Correlation between employment change and size in the primary sectors across the EU12



Map 4-4: "Relative" shares of employment in the primary sectors measured across the ESPON space



Map 4-5: "Relative" shares of employment in the primary sectors measured across the EU15 and EU12 spaces separately.



4.1.5 Possible Policy Combinations and Further Research

The comparative analysis of geographic concentration shows that most of the transformations that are occurring within the EU15 (growth of the service sectors, decline of employment and increase in concentration in the primary sectors, decline of employment and dispersion in the secondary sectors) are also occurring in the new member states. But within the boundaries of the EU12 geographic system these transitions have both a *faster pace and a stronger manifestation.* Some of this differences can only be revealed if the EU15 and the EU12 are kept as separate systems, since their interpretation as a unique entity tends to blur the difference of both.

This leads to the tentative conclusion that policy combinations at EU, national and regiional level already implemented in EU15 to strengthen positive specialization – where appropriate – or diversification – where that is the apppriate remedy - in principle could be expected to work also in the new member states. However, we should bear in mind that the scale of this round of enlargement, the great economic and social gap between the old and new member states and the dominating divergence trend in EU10 (as shown in Section 3.2 (Jos)) in contrast to convergence in many EU15 states, poses an uprecedented challenge. A very plausible policy recommendation is that since the needs are much stronger in the new member states than in the past, the policy has do be loaded with much more and concentrated resources than in the past to be efficient.

In the Final Interim Report we will develop these analysis in three different directions:

1. Compare the analysis of regional specialisation based on employment with the analysis based on GVA in the three sectors. This will provide a better picture of regional specialisation in terms of economic outputs and performance.
2. Deepen the level of analysis to the NUTS3 level
3. Extend the analysis of geographic concentration investigating and comparing individual countries as separate systems

4.2 Targeting policy combinations to meet the needs after enlargement

Jörg Neubauer, Lars Olof Persson

4.2.1 Where and why do spatial problems tend to subsist? - Empirical evidence from previous enlargements

The European Forecasting Network published in Spring 2003 a report on the Euro Area Outlook, which among other things gave a picture of the spatial effects of previous enlargement waves. From this report, along with the case study on Portuguese accession launched in our SIR will help us enumerate some of the problems that enlargement as a process has posed for previous new member states.

For regions in the 1980s enlargement wave (Greece, Spain and Portugal) regions in these countries tended to increase their differences and to polarise their behaviour towards their own group's average value. The better-positioned regions in these countries have tended to move towards EU15 levels, while the poorest regions have not. EFN calls this the "development trap".

EFN summarizes that generally regions that have diversified sectoral structure, high tech industries and relatively high R&D expenditures together with qualified labour could benefit from integration to improve their positions, but regions that tended to specialize in the agricultural sectors and low tech, low R&D industries, with lower-skilled workers tended to be caught in the development trap. This is also echoed in section 3.4 of this report (above). EFN also reported that despite infrastructure improvements, there was a negative correlation between distance from the European Core and GDP/capita.

The experience of the Portuguese accession to the EU in 1986 depicted in our SIR (Aug, 2003) has shown that European integration has stimulated economic growth and social well-being in Portugal as a whole, regional imbalances are still quite strong and can generally be described as a costal/interior (or urban/rural) divide. Structural Funds have been extremely important in Portugal in decreasing time and costs distances to the European Core, as well as boosting intra-regional accessibility, but apparently economic cycles in the European economy may be even more influential to the convergence that is happening, than is European funding. Portuguese integration into the EU precipitated a decline of traditional sectors, but

has created new opportunities in more knowledge and capital intensive industries, although the pattern of regional disparities have not changed significantly.

4.2.2 The Enlarged EU's Fringe, Shrinking, Rustic and Rustbelt Communities in need of Policy Combinations

Throughout the previous sections of this chapter we have elaborated spatial relevant development trends affecting the ESPON space. Along with each trend comes the pressure to adapt to changes leading to reorganisation of the national and European urban system(s) at varying speeds and levels. The outcome of reorganisation, however, will be different for different structural types of regions and will also depend on which impact integration forces issuing from enlargement (Europeanisation) may have.

4.2.2.1 How to identify regions needing extra support?

Against this background we set out to apply a composite perspective asking where in the ESPON space there are structural types of regions that may be in need of various policy interventions to attain the normative territorial goals of competitiveness and cohesion, in particular when taking into account the EU's enlargement. Hereby we seek to identify parts of the territory which are likely to be problematic in the development of a spatially balanced polycentric structure, allegedly crucial to contributing to realisation of these normative territorial goals. The policy implications given for each typology sketch, however, are of a very speculative nature at this point and are mainly intended to give some idea of what types are interventions may be analysed in the Final Report.

4.2.2.2 Principles for the typology

In order to target the regions of the ESPON space we focus on those characteristics allowing for complete quantitative observation at NUTS 3 level. Assumptions are made for particular types of regions for which enlargement may mean extraordinary pressure to reorganise their urban structure in a way counteracting the development of a balanced polycentric spatial tissue across the ESPON space. Each typological scoping is approached as follows:

- *Step 1: Formulating a hypothesis on problematic structural types of regions.*
- *Step 2: Deriving a set of indicators suitable to identify those regions.*
- *Step 3: Classifying regions by combination of extreme indicator values.*

The indicator set comprises five indicators, which depict one regional characteristic relevant to the assumption made. By looking at the extreme indicator values it can be ascertained firstly, to which extent the structure of a region may be problematic within the context assumed (i.e. number of indicator values in highest or lowest quartile) and secondly, which characteristic(s) are most relevant to give the region a problematic structure (i.e. type of indicator value(s) in highest or lowest quartile). The more extreme indicator values (positive or negative) are evident in regions that may be more exposed to the assumed effect of enlargement.

4.2.3 Draft typologies mapping regions with problems/needs in reaching the 3 objectives

The draft typologies identify regions that are likely to be affected negatively by enlargement. It is observed how many of the five indicators do have their values in the lowest quartile. At the same time there are also regions that will experience positive impact of enlargement. Both types of regions should be discussed together if one aims to conclude on policy needs to develop e.g. a balanced polycentric tissue. However, this remains to be incorporated.

The following four structural types of regions may be in particular problematic:

4.2.3.1 Typo 1: EU's 'Fringe' communities:

Ceteris paribus, regions with peripheral location, low population density, low level of economic wealth and currently slow growth rate are expected to be less attractive for private investors and qualified mobile labour than other regions. We assume that low level of wealth and slow growth in the recent past reflects poor competitiveness of the regional economy in a situation where international competition was less fierce than in the enlarged EU. We also assume, and based upon experiences of previous enlargement, that the centre – periphery pattern will be accentuated as competition is strengthened.

Three groups of indicators are used to distinguish EU's 'Fringe' communities (regions), namely accessibility indicators, population indicators and economic indicators. The complete set is listed in Table 4-3. Low indicator values (or decrease) indicate 'Fringe' characteristics.

Table 4-3: Indicators for Typo 1

I11	Accessibilty (European+EU15+AC12+National dimension)	2001
I12	Population density (inhabitants/km²)	2000
I13	Total population	2000
I14	GDP (PPS) per capita	2000
I15	GDP (PPS) per capita, relative change to EU15 average	1995-2000

Map 4-6 depicts EU's 'Fringe' communities. Indicator I11 (accessibility) is used without the national dimension, which remains to be incorporated. There are no extreme 'Fringe' communities in the ESPON space having all five indicator values in the lowest quartile. However, some three percent of the ESPON space NUTS 3 regions have at least four indicator value low points. An overview on the characteristics of the EU's 47 extreme 'Fringe' regions is given in Table 4-4. These regions are mainly located in Romania, Bulgaria, Greece, Portugal, Scotland and in the coastal parts of East Germany. Furthermore Haute-Alpes in France, the Swedish regions of Jämtland and Gotland as well as Kainu and Itä-Uusimaa in Finland also belong to this group. The region of Itä-Uusimaa located adjacent to Helsinki receives its strong 'Fringe' status mainly due to a small total population and a relative decrease of its GDP (PPS) per capita as compared to the EU15 since the population strongly increased in the period in question.

Map 4-6: EU's 'Fringe' communities

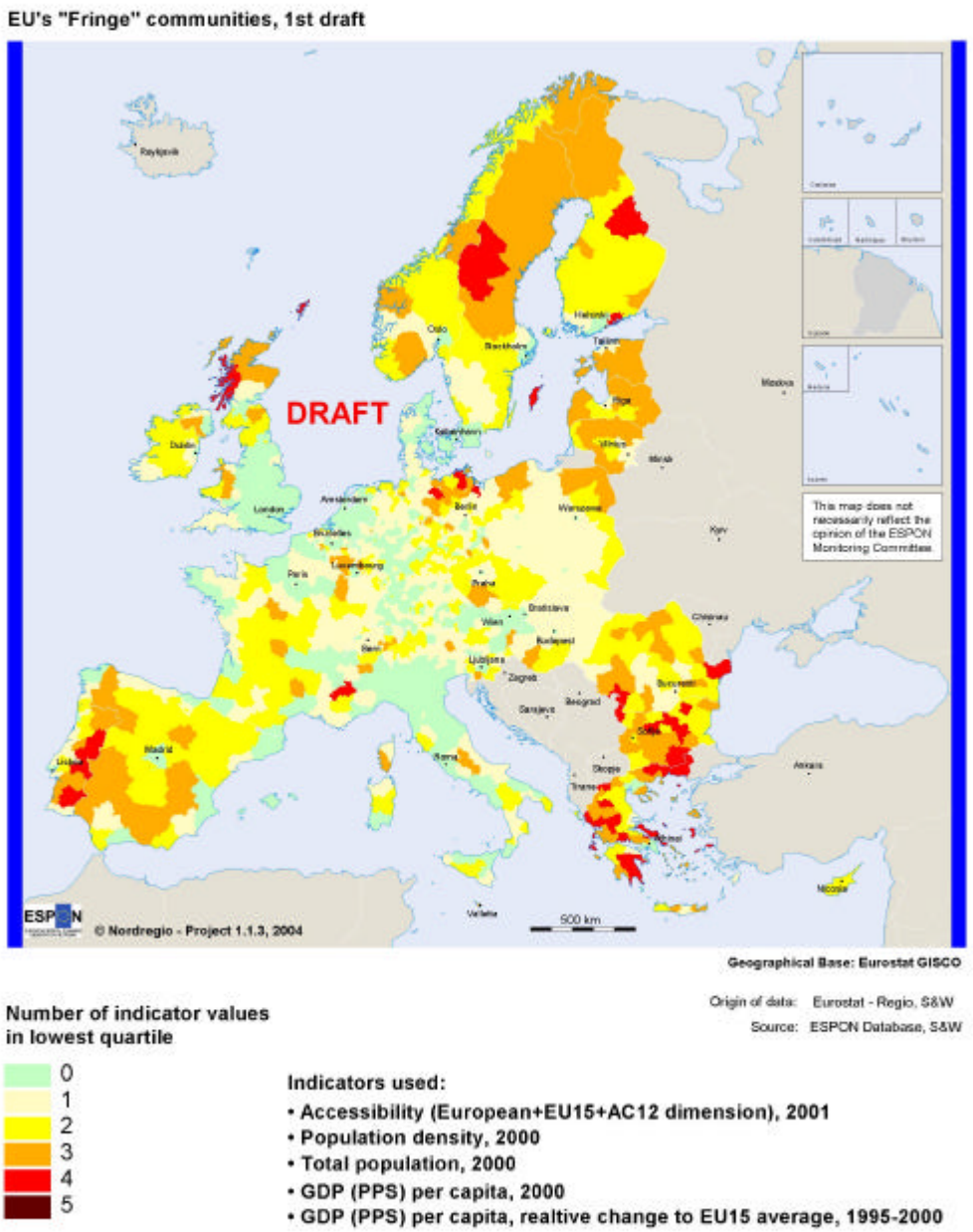


Table 4-4: The EU's extreme 'Fringe' communities and their characteristics (Q1=indicator value in highest quartile, Q4=indicator value in lowest quartile)

NUTS 3	Region	I11	I12	I13	I14	I15
BG011	VIDIN	Q4	Q4	Q3	Q4	Q4
BG022	LOVECH	Q4	Q4	Q3	Q4	Q4
BG023	VELIKO TARNOVO	Q4	Q4	Q2	Q4	Q4
BG035	RAZGRAD	Q4	Q4	Q3	Q4	Q4
BG053	HASKOVO	Q4	Q4	Q2	Q4	Q4
BG056	KARDZHALI	Q4	Q4	Q3	Q4	Q4
BG062	SLIVEN	Q4	Q4	Q3	Q4	Q4
DE808	DEMMIN	Q4	Q4	Q4	Q4	Q3
DE80A	LUDWIGSLUST	Q3	Q4	Q4	Q4	Q4
DE80D	NORDVORPOMMERN	Q4	Q4	Q4	Q4	Q3
DE80I	UECKER-RANDOW	Q3	Q4	Q4	Q4	Q4
FI134	KAINUU	Q4	Q4	Q4	Q3	Q4
FI162	ITA-UUSIMAA	Q4	Q4	Q4	Q2	Q4
FR822	HAUTES-ALPES	Q4	Q4	Q4	Q2	Q4
GR111	EVROS	Q4	Q4	Q4	Q4	Q1
GR112	XANTHI	Q4	Q4	Q4	Q4	Q3
GR113	RODOPI	Q4	Q4	Q4	Q4	Q2
GR114	DRAMA	Q4	Q4	Q4	Q4	Q3
GR131	GREVENA	Q4	Q4	Q4	Q4	Q1
GR134	FLORINA	Q4	Q4	Q4	Q4	Q1
GR141	KARDITSA	Q4	Q4	Q4	Q4	Q1
GR211	ARTA	Q4	Q4	Q4	Q4	Q3
GR212	THESPROTIA	Q4	Q4	Q4	Q4	Q2
GR214	PREVEZA	Q4	Q4	Q4	Q4	Q3
GR223	KEFALLINIA	Q4	Q4	Q4	Q4	Q1
GR224	LEFKADA	Q4	Q4	Q4	Q4	Q1
GR242	EVVOIA	Q4	Q4	Q3	Q4	Q4
GR243	EVRYTANIA	Q4	Q4	Q4	Q4	Q2
GR245	FOKIDA	Q4	Q4	Q4	Q4	Q2
GR251	ARGOLIDA	Q4	Q4	Q4	Q4	Q1
GR252	ARKADIA	Q4	Q4	Q4	Q4	Q1
GR254	LAKONIA	Q4	Q4	Q4	Q4	Q1
GR412	SAMOS	Q4	Q4	Q4	Q4	Q1
GR413	CHIOS	Q4	Q4	Q4	Q4	Q1
PT126	PINHAL INTERIOR SUL	Q4	Q4	Q4	Q4	Q1
PT127	SERRA DA ESTRELA	Q4	Q4	Q4	Q4	Q2
PT128	BEIRA INTERIOR NORTE	Q4	Q4	Q4	Q4	Q2
PT129	BEIRA INTERIOR SUL	Q4	Q4	Q4	Q4	Q3
PT12A	COVA DA BEIRA	Q4	Q4	Q4	Q4	Q2
PT142	ALTO ALENTEJO	Q4	Q4	Q4	Q4	Q3
PT144	BAIXO ALENTEJO	Q4	Q4	Q4	Q4	Q3
RO025	TULCEA	Q4	Q4	Q2	Q4	Q4
RO043	MEHEDINTI	Q4	Q4	Q2	Q4	Q4
SE072	JAEMTLANDS LAEN	Q4	Q4	Q4	Q2	Q4
SE094	GOTLANDS LAEN	Q4	Q4	Q4	Q3	Q4
UKM43	LOCHABER, SKYE AND LOCHALSH AND ARGYLL AND THE ISLANDS	Q4	Q4	Q4	Q3	Q4
UKM46	SHETLAND ISLANDS	Q4	Q4	Q4	Q1	Q4

Policy implications for "Fringe Regions"

Fringe regions tend to be located at just the periphery of the European space. Primarily due to their low population density and their distance from major hubs of economic activity (with important exceptions for Portugal, Greece and Finland) it could be assumed that these areas are important areas of natural conservation and/or experience relatively few pressing environmental problems in the rural areas. Therefore any policies attempting to increase accessibility and economic growth in these areas should be careful to not do this at the expense of nature or cultural landscapes and this may be a fine line to tread. At the same time

the problems associated with social cohesion may be the most pressing problems requiring Structural fund intervention and national policy interventions.

By means of national policies, extended social policy should be developed *to secure key service provision* in Europe´s Shrinking regions. The EU should provide guidelines for which services should be considered as minimum standard for service accessibility in small town Europe. Extended Neighbourhood policy should be addressed to the Fringes and Border regions of the enlarged EU.

4.2.3.2 Typo 2: EU's 'Shrinking' communities:

Ceteris paribus, regions with poor demographic structure, negative population trends and low population mass and density, will be less attractive for private investors and qualified mobile labour than other regions. We assume that such regions are involved in a negative spiral of cumulative causation, with declining regional markets for the private sector and increasing per capita costs for public services.

The EU's 'Shrinking' communities typo focuses on the regional demographic structure. Thus different demographic indicators are used. The complete set is listed in Table 4-5.

Table 4-5: Indicators for Typo 2

Population change	1999-2000
Demographic Dependency ratio	1999
Net migration rate	1999
Natural change	1999-2000
Activity rate 15-64 years	1999

Formel 4-1 EU's 'Shrinking' communities. First sample of results. Regions with at least 3 indicators scoring in the extreme quartiles. NB.Missing data for some indicators will be completed in the Final Report. Preliminary calculation provided by Daniel Rauhut, ITPS**.**

Year 1999, bold 2000	**Natural pop change per 1000 inh**	**Dependency ratio**	**Net mig rate per 1000 inh**	**Activity rate 15-64**	**Population density per sqr km**
dk00e Viborg amt	0,86	1,72	-1,79	na	56,70
gr21 Ipeiros	-2,13	1,66	6,66	61,70	40,80
gr24 Sterea Ellada	-2,42	1,64	2,11	63,90	42,60
gr41 Voreio Aigaio	-4,37	1,83	2,73	59,00	47,70
es41 Castilla y León	-3,43	1,67	1,58	62,90	26,30
es42 Castilla-la Mancha	-0,29	1,73	2,29	63,00	21,50
es43 Extremadura	-0,37	1,72	0,56	62,60	25,80
fr21 Champagne-Ardenne	2,83	1,71	-3,20	66,90	52,40
fr3 Nord - Pas-de-Calais	4,75	1,75	-3,72	62,20	322,30
fr43 Franche-Comté	3,40	1,71	-1,25	69,10	69,00
fr63 Limousin	-3,66	1,77	3,94	67,10	42,00
it92 Basilicata	0,16	1,68	-1,48	52,80	60,70
itb Sardegna	-0,36	1,57	-0,42	56,50	68,60
pt14 Alentejo	-5,90	1,76	8,38	na	24,40
pt2 Açores (PT)	3,33	1,78	-13,73	62,40	103,20
se06 Norra Mellansverige	-3,81	1,77	0,48	75,40	13,10
se07 Mellersta Norrland	-3,93	1,76	-0,79	74,10	5,40
se08 Övre Norrland	-1,74	1,72	-1,55	71,70	3,30
se09 Småland med öarna	-2,25	1,79	0,00	77,80	24,10
bg01 Severozapaden	-9,66	1,75	2,03	**57,60**	55,60
bg02 Severen Tsentralen	-7,55	1,67	2,76	**59,90**	68,70
bg03 Severoiztochen	-3,56	1,63	0,15	**60,10**	67,50
bg06 Yugoiztochen	-2,66	1,66	-0,36	**58,10**	56,50
ee004 Lääne-Eesti	-2,99	1,75	100,00	na	**14,90**
ee006 Kesk-Eesti	-9,66	1,77	2,76	na	**15,90**
ee007 Kirde-Eesti	-3,31	1,66	-2,21	na	**53,40**
ee008 Lõuna-Eesti	-3,66	1,78	0,85	na	**22,40**
hu04 Dél-Dunántúl	-5,32	1,63	3,07	57,60	**68,60**
lt008 Telsiu (Apskritis)	0,55	1,77	-1,64	na	**43,40**
lv002 Vidzeme	-4,68	1,75	-6,34	na	**na**
lv003 Kurzeme	-4,23	1,71	-25,98	na	**23,60**
lv004 Zemgale	-3,41	1,71	-13,64	na	**na**
lv005 Latgale	-7,99	1,70	-2,32	na	**26,40**
pl0a Podlaskie	0,00	1,76	-1,55	67,40	**60,60**

The first sample of "Shrinking" communities – NB! based on incomplete data - provides a shortlist, which will be extended and elaborated in the Final Report. The shortlist points out one Shrinking region in Denmark, Hungary, Lithuania and Poland, two in Italy and Portugal, three in Spain and Greece, and four in France, Bulgaria, Sweden, Estonia and Latvia. The regions experiencing the most complex problems associated with population change are Mellersta Norrland in Sweden, Seveoizapaden and Yugoiztochen in Bulgaria and Kurzeme in Latvia.

Policy implications for "Shrinking" communities

"Shrinking" communities require policy measures designed to make the areas more attractive to net migration and to retain existing citizens. They may be experiencing a loss of the active age labour force due to loss of jobs and the lure of higher paying employment in close by major cities. The types of policy interventions needed here are not only those focused on Structural funding in Objective 1 regions, but also regional and local measures to find a distinct role for economic activity in the areas and to avoid the risk of becoming of "bedroom" communities. In the shrinking communities, bottom-up processes of governance are needed to endow these regions with not only the capacity to start the process of change themselves, but also to capitalise on already existing knowledge of the spatial economic and social structures. This may entail an infusion of efforts based on innovation and knowledge sectors.

4.2.3.3 Typo 3: EU's 'Rustic' communities:

Ceteris paribus, regions specializing in the primary sector, with low income levels and a slow rate of structural transformation in the recent past, but now moving towards secondary and tertiary sectors are more likely to experience poor economic growth rate in the near future than other agriculture-dominated regions. We assume that current low income and technology levels in agriculture will not attract investments in agriculture in these communities as much as in other more high technological agricultural regions We also assume that the slow rate of transformation from the agrarian economy in the past reflects the fact that the manufacturing and service sectors did not find these regions attractive as economic locations in the pre-accession situation, when international competitions was less fierce than after enlargement.

The EU's 'Rustic' communities are scoped by looking at the regional industrial structure with focus on the primary sector. In addition, productivity is indicated for the total regional economy but also for the primary sector. In the latter case the size of agricultural land per person employed in primary sector is measured. Here it is assumed that fewer workers are needed to exploit a square kilometre of agricultural land as the primary sector becomes more competitive. Unfortunately using agricultural employment instead of primary sector employment was not possible due to data gaps. Hence regions with a high share of employment in fishery or forestry tend to turn out being less competitive in this regard. Table 4-6 shows the complete set of indicators. Generally low indicator values make a region more 'Rustic'. However, a low share and/or a decrease in primary sector employment, indicates "Rustic" characteristics

Table 4-6: Indicators for Typo 3

I31	Primary sector employment, share	1996
I32	Change in primary sector employment (p.a.)	1991-1996
I33	GDP (PPS) per person employed	1996
I34	Agricultural land (km^2) per person employed in primary sector	1990
I35	Tertiary sector employment, share	1996

Map 4-7 shows EU's 'Rustic' communities on a map. There are six regions with all indicator values in the lowest quartile. These extreme 'Rustic' communities are all together located in Romania. The very rustic communities having four indicator values in the lowest quartile can be primarily found in Romania as well as in Bulgaria, Latvia, Lithuania, the Czech Republic, Slovenia and Slovakia but even in Portugal, Italy and Greece. Table 4-7 lists the characteristics of the EU's 63 very and extreme 'Rustic' regions.

Map 4-7: EU's 'Rustic' communities

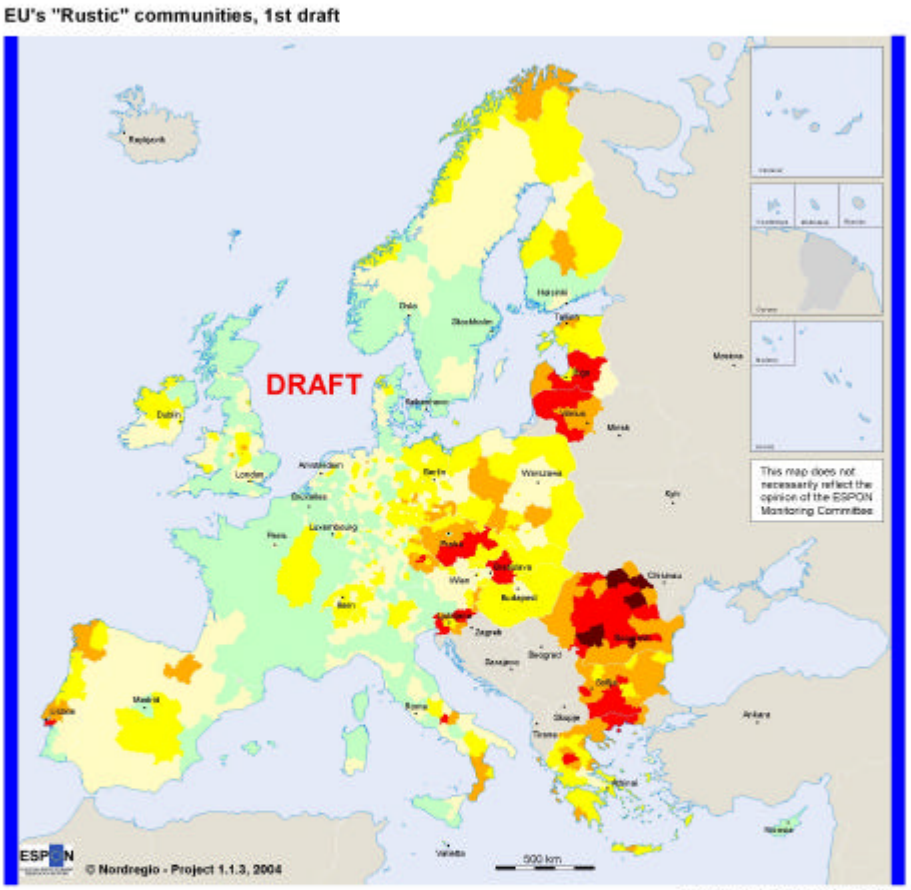


Table 4-7: The EU's extreme 'Rustic' communities and their characteristics (Q1=indicator value in highest quartile, Q4=indicator value in lowest quartile)

NUTS_3	Region	I31	I32	I33	I34	I35
BG024	GABROVO	Q4	Q1	Q4	Q4	Q4
BG043	BLAGOEVGRAD	Q4	Q1	Q4	Q4	Q4
BG044	PERNIK	Q4	Q1	Q4	Q4	Q4
BG051	PLOVDIV	Q4	Q1	Q4	Q4	Q4
BG054	PAZARDZHIK	Q4	Q1	Q4	Q4	Q4
BG055	SMOLYAN	Q4	Q1	Q4	Q4	Q4
BG056	KARDZHALI	Q4	Q1	Q4	Q4	Q4
CZ031	BUDEJOVICKY	Q4	Q4	Q4	Q2	Q4
CZ053	PARDUBICKY	Q4	Q4	Q4	Q2	Q4
CZ061	JIHLAVSKY	Q4	Q4	Q4	Q2	Q4
CZ071	OLOMOUCKÝ	Q4	Q4	Q4	Q3	Q4
DE221	LANDSHUT, KRFR.ST.	Q4	Q4	Q1	Q4	Q4
DE22B	STRAUBING-BOGEN	Q4	Q4	Q4	Q1	Q4
GR112	XANTHI	Q4	Q1	Q4	Q4	Q4
GR113	RODOPI	Q4	Q1	Q4	Q4	Q4
GR114	DRAMA	Q4	Q1	Q4	Q4	Q4
GR115	KAVALA	Q4	Q1	Q4	Q4	Q4
GR144	TRIKALA	Q4	Q1	Q4	Q4	Q4
IT721	ISERNIA	Q4	Q4	Q2	Q4	Q4
LT001	ALYTAUS (APSKRITIS)	Q4	Q4	Q4	Q2	Q4
LT003	KLAIPEDOS (APSKRITIS)	Q4	Q4	Q4	Q2	Q4
LT004	MARIJAMPOLES (APSKRITIS)	Q4	Q4	Q4	Q1	Q4
LT005	PANEVEZIO (APSKRITIS)	Q4	Q4	Q4	Q1	Q4
LT006	SIAULIU (APSKRITIS)	Q4	Q4	Q4	Q2	Q4
LT007	TAURAGES (APSKRITIS)	Q4	Q4	Q4	Q1	Q4
LT008	TELSIU (APSKRITIS)	Q4	Q4	Q4	Q2	Q4
LV002	VIDZEME	Q4	Q4	Q4	Q1	Q4
LV004	ZEMGALE	Q4	Q4	Q4	Q1	Q4
PT133	PENINSULA DE SETUBAL	Q4	Q4	Q4	Q4	Q1
RO014	NEAMT	Q4	Q3	Q4	Q4	Q4
RO024	GALATI	Q4	Q3	Q4	Q4	Q4
RO026	VRANCEA	Q4	Q3	Q4	Q4	Q4
RO031	ARGES	Q4	Q3	Q4	Q4	Q4
RO033	DAMBOVITA	Q4	Q3	Q4	Q4	Q4
RO035	IALOMITA	Q4	Q4	Q4	Q3	Q4
RO036	PRAHOVA	Q4	Q3	Q4	Q4	Q4
RO043	MEHEDINTI	Q4	Q4	Q4	Q3	Q4
RO053	HUNEDOARA	Q4	Q3	Q4	Q4	Q4
RO063	CLUJ	Q4	Q3	Q4	Q4	Q4
RO064	MARAMURES	Q4	Q3	Q4	Q4	Q4
RO071	ALBA	Q4	Q3	Q4	Q4	Q4
RO072	BRASOV	Q4	Q3	Q4	Q4	Q4
RO073	COVASNA	Q4	Q3	Q4	Q4	Q4
RO074	HARGHITA	Q4	Q3	Q4	Q4	Q4
RO075	MURES	Q4	Q3	Q4	Q4	Q4
RO076	SIBIU	Q4	Q3	Q4	Q4	Q4
RO081	BUCURESTI	Q4	Q3	Q4	Q4	Q4
SI002	PODRAVSKA	Q4	Q3	Q4	Q4	Q4
SI003	KOROSKA	Q4	Q3	Q4	Q4	Q4
SI004	SAVINJSKA	Q4	Q3	Q4	Q4	Q4
SI005	ZASAVSKA	Q4	Q3	Q4	Q4	Q4
SI00A	NOTRANJSKO-KRASKA	Q4	Q3	Q4	Q4	Q4
SI00B	GORISKA	Q4	Q3	Q4	Q4	Q4
SI00C	OBALNO-KRASKA	Q4	Q3	Q4	Q4	Q4
SK021	TRNAVSKÝ KRAJ	Q4	Q4	Q4	Q3	Q4
SK022	TRENCIANSKÝ KRAJ	Q4	Q4	Q4	Q3	Q4
SK023	NITRIANSKÝ KRAJ	Q4	Q4	Q4	Q2	Q4
RO011	BACAU	Q4	Q4	Q4	Q4	Q4
RO013	IASI	Q4	Q4	Q4	Q4	Q4
RO015	SUCEAVA	Q4	Q4	Q4	Q4	Q4
RO042	GORJ	Q4	Q4	Q4	Q4	Q4
RO045	VALCEA	Q4	Q4	Q4	Q4	Q4
RO082	ILFOV	Q4	Q4	Q4	Q4	Q4

Policy implications for "Rustic" communities

The extreme types of rustic communities tend to largely be located in the accession countries and new Member States. They may tend to be heavily agricultural areas, although from the data this is only speculation, yet they are experiencing a decline in other tertiary sectors such as fishing of forestry. The key type of policy intervention needed here may be those that give revitalise the growth process, but do so in a sustainable manner so as not to drastically break down the resource base on which the sectors are founded. Achieving economic cohesion in these communities will be primarily an EU and national priority and coherent integration of sectoral policies (such as CAP funding, environmental policy and national resource laws) may be of importance. These communities may stand to benefit most greatly from increased accessibility and measures to boost polycentrism at the national level as it would enable them to more easily bring goods to major economic centers.

Rural Development Policy should focuson the enormous needs in EU's *Rustic communities.* EU's RDP should be broadened to focus more on *sustainable rural development* and suggest possibilities to support funding the often risk-filled attempts to switch to more environmentally-friendly methods of agricultural production. The RDR budget in old and new member states should be adjusted to the particular needs for rural development and environmental management.

4.2.3.4 Typo 4: EU's Rust-belt:

Ceteris paribus, regions specializing in manufacturing industries, with low income levels and slow growth rates of the regional growth in the recent past are more likely to experience poor economic growth rates in the near future than in other manufacturing regions. We assume that current low income and technology levels in the manufacturing industry will not attract new industrial investments as much as in other manufacturing regions We also assume that the slow growth rates in the recent past reflect the fact that the manufacturing and service sectors did not find these regions attractive as economic locations in the pre-accession situation, when international competition was less fierce than after enlargement.

The EU's Rust-belt is scoped by looking at the regional industrial structure with focus on the secondary sector. Furthermore the development in economic performance and unemployment complete the set of indicators, as shown in Table 4-8. Generally low indicator values indicate Rust-belt characteristics except for secondary sector employment, where a high share and/or and increase in employment indicates those characteristics.

Table 4-8: Indicators for Typo 4

I41	Secondary sector employment, share	1996
I42	Change in secondary sector employment (p.a.)	1991-1996
I43	GDP (PPS) per capita, relative change to EU15 average	1995-2000
I44	Unemployment rate	2000
I45	Tertiary sector employment, share	1996

Further Research and Tentative Policy Implications

In summary, these elementary typologies aim at a preliminary assessment of where and to which extent there appear risks for a monocentric development or potential for polycentric development at different levels. The typology should give indications of the differential needs for coordinated policy intervention at EU, national and regional level.

In the next step – to be pursued in the final year of our project - we introduce qualitative information, describing *unique* features for regions within each typology, namely

- Cultural aspects, e g language barriers and commonalities
- Location of specialized functions
- Indicators of administrative capacity
- Existing or Planned Cooperation strategies between region
- Natural heritage
- Industrial structure and change

From the qualified typology, we will – in the Final Report - address more in detail policy orientation to all three territorial levels. At the EU level, we recognize that the Commission has identified themes and territorial priorities where, it argues, the EU has a justifiable role: industrial areas undergoing conversion; urban areas in difficulty; areas facing specific geographical or demographic handicaps; cross-border, transnational and interregional co-operation; social inclusion; equality of opportunity; and the new economy and knowledge society.

We also recognize that the Commission has adopted a proposal of five new regulations for renewed Structural Funds and instruments. Over the period 2007-2013, these instruments present about one third of the EU budget. The majority of this amount will be spent in less-developed Member States and regions. However, within these geogrphical limits, we assess that there is a clear need to target support even to the most problematic regions, such as the ones we have detected in this typology.

The new general regulation defines common principles, rules and standards for the implementation of the ERDF, the ESF and the Cohesion Fund. In combinations, funding ideally priorities include research, innovation, environmental issues and risk prevention, Infrastructure retains an important role, especially in the least developed regions. ESF funds aims to achieve progress towards full employment, to improve quality and productivity at work, and to promote social inclusion and cohesion. The Cohesion fund contributes in the field of the environment and trans-European networks. European grouping of cross-border co-operation aims to overcome existing obstacles hindering cross-border co-operation.

However, we cannot expect that the new programme, largely based on previous policies applied in EU15, will be able to meet *the enormous and differential needs* coming from least favoured enlargement regions. There is a strong demand for innovative policy and policy innovations at all levels. This leads to our recommendation for policy combinations in the course of enlargement: Allow for more experimental or ad hoc approaches to policy design and implementation. In implementation, feed-back processes and process evaluation at all levels have to be built-in to achieve a continuously adaptive and learning system for reaching a more polycentric, sustainable and cohesive Europe.

4.3 Needs in Border Regions

Gabriela Tatzberger, Friedrich Schindegger[2]

Cross-border cooperation remains one of the most crucial tools for achieving the goal of economic and social cohesion, particularly with regard to the border regions of the EU15/EU10, the EU10/EU10 and the EU10/new neighbours. As seen in the diagram below from Chapter 3.1, the performance of border regions in general, but in particular of the accession countries, tends to be lower than the EU average. This chapter examines some of the existing barriers and opportunities of to border regions of the accession countries for economic and social integration.

Yet the physical, economic and ethnic composition of border regions in the New Member States varies widely across the territory and thus also the needs and preconditions for social and economic integration into the EU.

[2] ÖIR, Vienna and Iván Illés, Centre for Regional Studies – Hungarian Academy of Sciences, Budapest.For data sources please see 1.1.3 SIR, chapter 3.

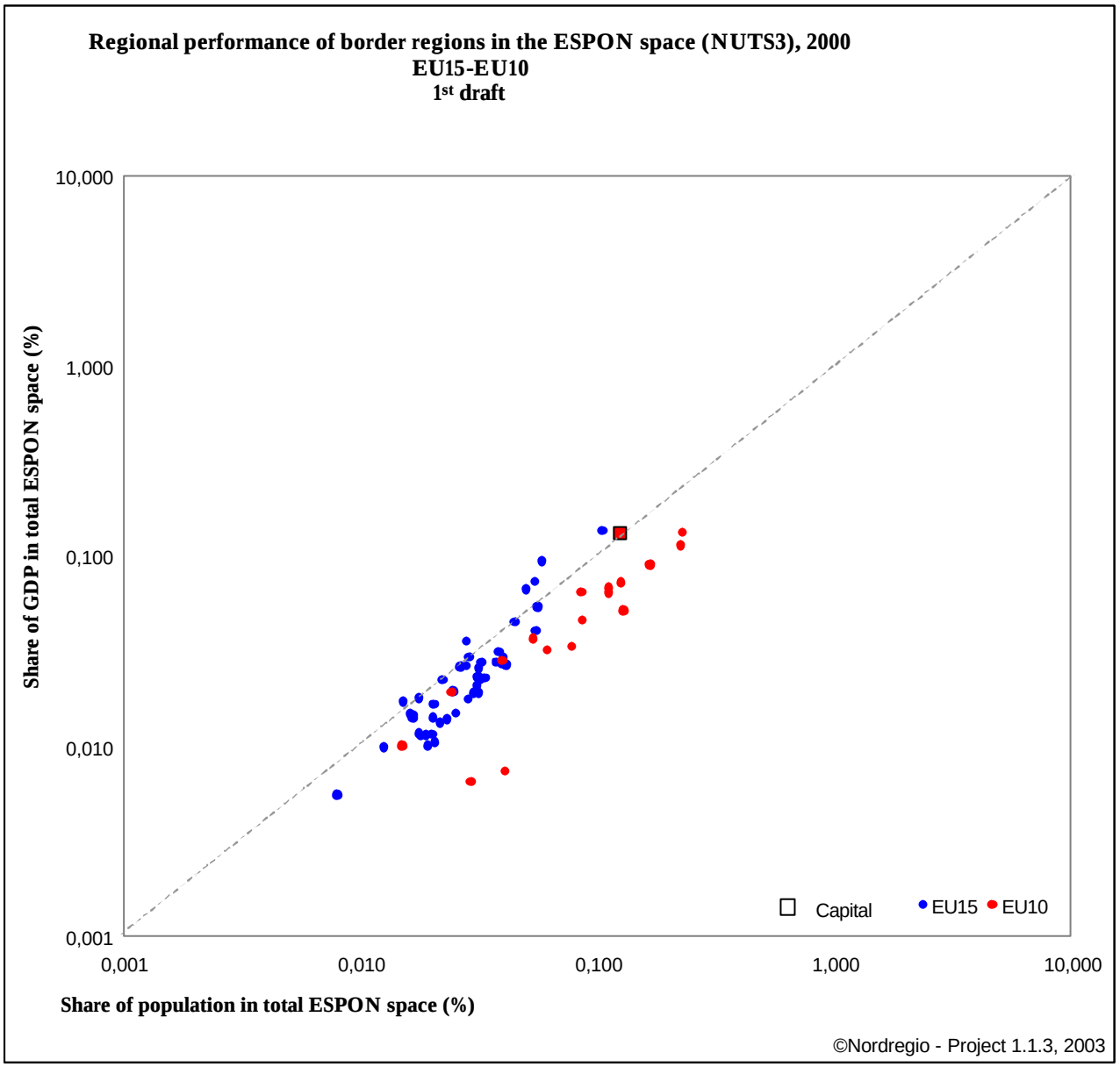


Figure 4-10: Regional performance of border regions in the ESPON space (NUTS3), 2000 EU15-EU10

In this chapter, different components of border characteristics in the border regions of the EU enlargement area are dealt in more detail, by analysing the geographic type of borders, ethnic-historical types of borders, density of border crossings, economic disparities and the membership in Euroregions and transnational Working Communities. Building on the work done in the SIR, these are the basic components for elaborating first draft typologies for "border typology for integration potential" trying to identify on NUTS III level forerunners, hardworkers, candidates of integration and handicapped for integration. We point out the need for directed policies and combinations of policies to increase the performance of EU-10 border regions by increasing cross-border flows of people, goods, services and knowledge. As

a complement to the chapter, which is focused on simple quantitative measures of barriers and opportunities, we outline a proposal for case studies in order to examine the dynamics, opportunities, barriers and needs of border regions in more qualitative detail.

4.3.1 Components in Border characteristics

118 NUTS3 level border regions have been identified in the EU enlargement area (including Romania and Bulgaria, but not including Cyprus and Malta.[3] In the framework of this analysis five types of classification have been prepared for these border regions.

- according to the number of neighbouring countries;
- according to the geographical type of borders;
- according to the ethnic-historical type of borders;
- according to the density of border crossings;
- according to the membership in Euroregions and transnational Working Committees.

Table 4-9: The number of neighbouring countries

	Number of	number of neighbouring countries			
	border regions	1 country	2countries	3 countries	sea only
BG	18	12	5		1
CZ	11	7	4		
EE	5	3	1		1
HU	14	9	4	1	
LT	9	5	4		
LV	5	2	1	1	1
PL	19	11	4		4
RO	19	14	5		
SI	10	5	4	1	
SK	8	3	4	1	
Total	118	76	36	4	7

Out of the 118 border regions, 76 have one country as its cross-border neighbour, 36 have two neighbouring countries and four regions have 3 foreign neighbours. It is worth mentioning these last four regions: Szabolcs-Szatmár-Bereg county in Hungary (neighbours are Slovakia, Ukraine and Romania), Trnavsky kraj in Slovakia (neighbours are the Czech Republic, Austria and Hungary), Pomurska region in Slovenia (neighbours are Austria, Hungary and Croatia) and Latgale in Latvia (neighbours are Lithuania, Belarus and Russia). There are seven border regions that have only sea (maritime) external borders – six around the Baltic Sea and one at the Black Sea, but these are also important cooperation areas.

[3] 120 border regions were listed in the register prepared in the framework of ESPON 1.1.3. project. One of them, Osrednjeslovenska, in Slovenia, as a result in the change of administrative borders in 2000 is not a border region any more. The other region, Centralny Šlaskie, in Poland is not a border region, though its boundaries are very close to the state border.

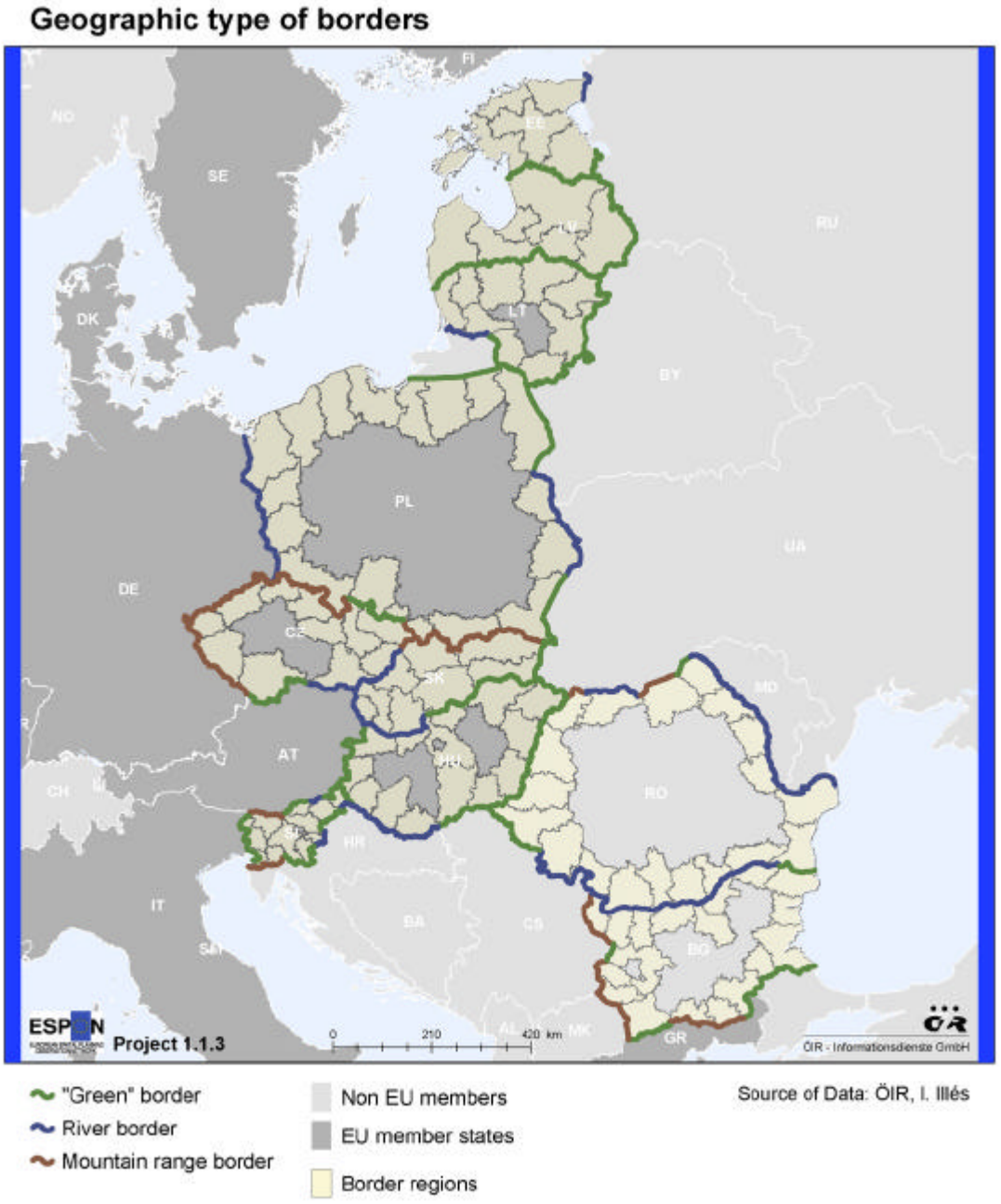
In the whole of Europe, there are 5 border regions that have 3 foreign countries as their neighbours and 4 of these 5 are in the enlargement area (the fifth one is in the extreme north of Finland).

4.3.1.1 The geographical types of borders

Three types of geographic borders have been distinguished on Map 4-8:

- river borders where the border is constituted by a river of substantial breadth and rate of flow (and possibly, but not necessarily navigable);
- mountain borders constituted by a mountain range of more than 1000m height;
- borders with no natural barriers of crossing (called “green” borders, after the colouring of maps at such places).

Map 4-8: Geographic types of borders



Border sections are in many cases not homogeneous. In such cases, they are classified according to the dominant type of geomorphology. Borders with two or more countries are classified as combined types:

Table 4-10: The geographical types of borders

	Border with one country			Border with one country +sea				Borders with two or more countries						total
	river	mountain	green	sea only	sea+ river	sea+ mountain	sea+ green	2 river	2mountain	2green	river+ mountain	river+ green	mount+ green	
BG	5	3	2	1			2		1	1	2		1	18
CZ		5	2					1	1				2	11
EE			1	1	1		1			1				5
HU	4		5							3		2		14
LT	1		4		1					3				9
LV				1			3			1				5
PL	4	1	4	4	1		1		1	1	1		1	19
RO	9	1	2		1		1	1		1	1	1	1	19
SI	1	1	3			1			1			2	1	10
SK	2		1					2	1	1			1	8
Total	26	11	24	7	4	1	8	4	5	12	4	5	7	118

By breaking down border sections with two or more countries we have altogether 168 regional border sections. 68 of them (40 percent) are “green” borders, 47 (28 percent) are river borders, 33 (20 percent) are mountain range borders, and 20 (12 percent) are sea borders. The new internal and the new external borders of the EU according to geographic types is significantly different.

Table 4-11: Types of border sections at internal and external borders

	Distribution of border sections according to geographical types of borders in km			
	“green” border	River border	Mountain border	Total
New internal borders in the enlargement area (2004.05.01)	3885 (48%)	1253 (15%)	2892 (37%)	8030 (100%)
New external borders (2004.05.01)	3023 (69%)	1215 (28%)	140 (3%)	4378 (100%)

While 48 percent of the new internal borders are “green” borders, without significant geographical barriers, the respective percentage at the new external borders is 69 percent. But the most significant difference can be found in the case of mountain borders. 37 percent of the new borders are constituted by mountain ranges; the respective percentage in the case of external borders is only 3 percent. This means that overcoming the internal barriers in terms of new transport connections would be a rather expensive enterprise, while controlling the open external borders also will be an expensive undertaking.

4.3.1.2 The ethnic-historical types of borders

Three ethnic-historical types of borders were distinguished (please see Map 4-9):

- border regions, where the ethnic groups on the two sides of the border are different, they speak different languages, but have lived side by side for centuries and relatively good relations have developed between them;
- border regions where the ethnic composition of the population changed substantially during the twentieth century. Border regions are classified to belong to this group if the majority ethnic group changed in the region during the 20th century.
- border regions where the majority ethnic group on the two sides of the border is the same. This category was the most difficult to identify. In some countries, there are no statistics about the ethnic composition of the regions. The other difficulty is the definition of border regions. In several countries, NUTS3 regions comprise large areas, far beyond the proper border zones. In some countries it is a deliberate intention to define and delineate administrative regions in a way that in none of them should the ethnic minority constitute the majority.

Map 4-9: Ethnic-historical types of borders regions

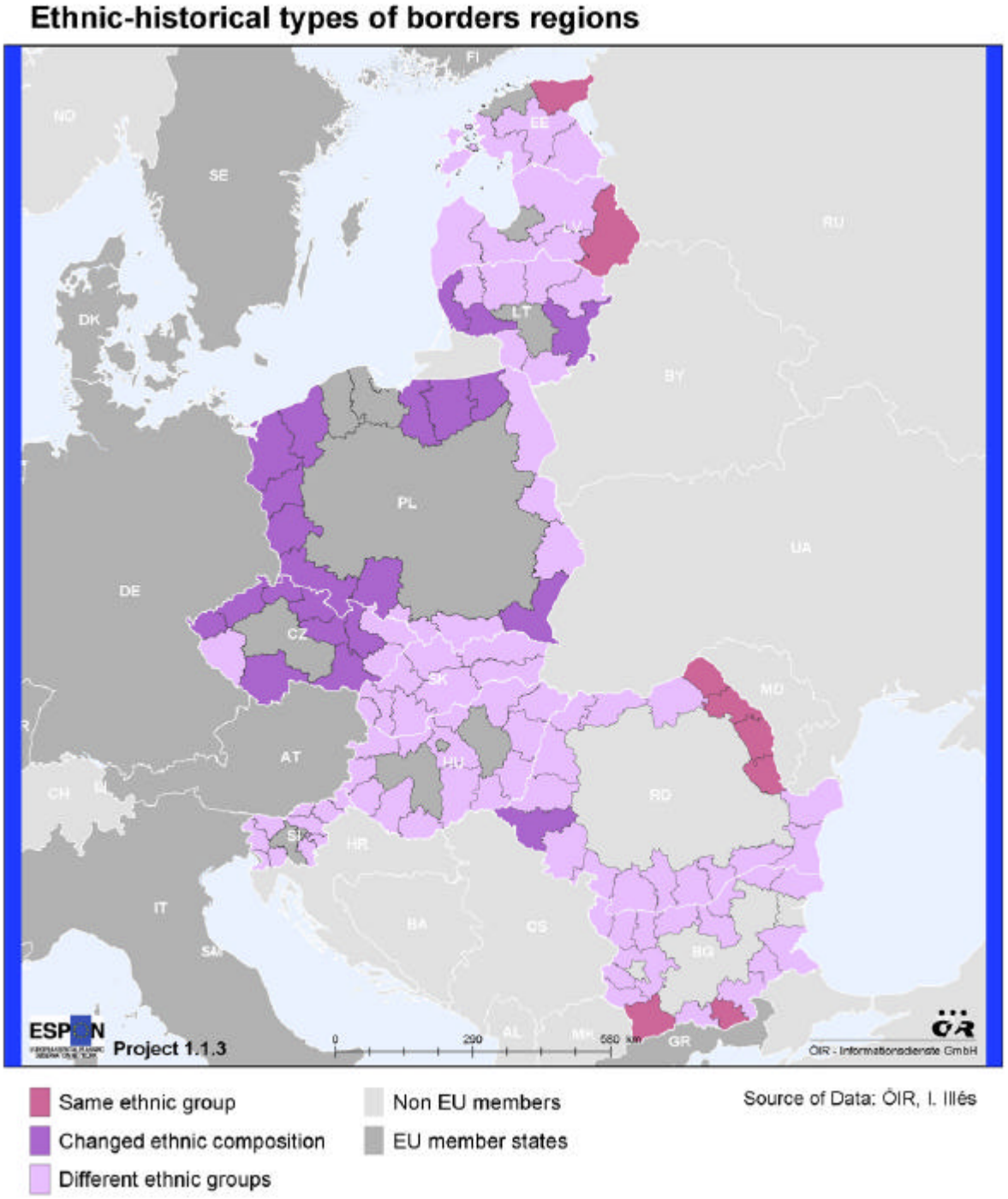


Table 4-12: The ethnic-historical type of borders

	Number of border regions.	Different ethnic groups	Same ethnic group on both sides of the border	Ethnic composition changed substantially
BG	18	16	2	
CZ	11	3		8
EE	5	4	1	
HU	14	19		
LT	9	6		3
LV	5	3	1	1
PL	19	7		13
RO	19	19	4	1
SI	10	12		
SK	8	10		
Total	118	95	8	26

In 84 (70 percent) of the 118 border regions, borders are dividing different ethnic groups that have lived there for centuries. In 26 (22 percent) of the border regions, the ethnic composition changed substantially during the 20th century. These are mostly the Polish, Czech and Lithuanian border regions, where the composition changed at the end of World War II, through massive forced migration. 24 of the 26 regions can be found in these three countries. In the other two regions, Riga in Latvia (now the majority is Russian) and Timis in Romania (Banat) the majority group changed through a slow immigration and emigration process, lasting for several decades during the second half of the 20th century.

There are only 8 regions in the whole enlargement area where the majority ethnic group is the same on both sides of the border at NUTS3 level. Four of them are on the Romanian-Moldovan border, where Romanians live on both sides of the borders. Two are in Bulgaria where the majority ethnic groups are Turks on the Greek-Bulgarian (Kardjali) and Macedonians on the Macedonian-Bulgarian (Blagoevgrad) border. Russians are the majority group in Kirde-Eesti and in Latgale on both sides of the Estonian – Russian and Latvian-Russian border, respectively. Finally, if we look at the NUTS4 level, than there are 5 Hungarian counties where the majority group (Hungarians) is the same on both sides of the borders, and there are 2 Slovenian regions, where the ethnic majority group in the adjacent Italian territories is the same.

4.3.1.3 The density of border crossings

Measuring the density of border crossings in a regional breakdown is a rather biased undertaking. Regional boundaries are usually short and the distribution of border crossings is rather uneven and irregular. Low crossing density in a region with a short border section is not a serious problem if there are enough crossing-points in the immediately adjacent areas. In analysing the following data, these circumstances must be taken into account.

Border-crossings are defined in this analysis as international road border crossings, permanently crossable and for citizens of every nation. Border crossings, crossable only for citizens of the two neighbouring countries and open only on certain days, or for some hours are not considered. The regional breakdown of the length of border is result of estimation, because official data on every country are not available. The indicator is: border-crossing points per 100 km of border. The reason for choosing this indicator and not the reciprocal one (border length per crossing) is that there are several regions where no crossing exists and dividing by zero is an undefined mathematical operation. See Map 4-10.

Map 4-10: Density of border crossing points

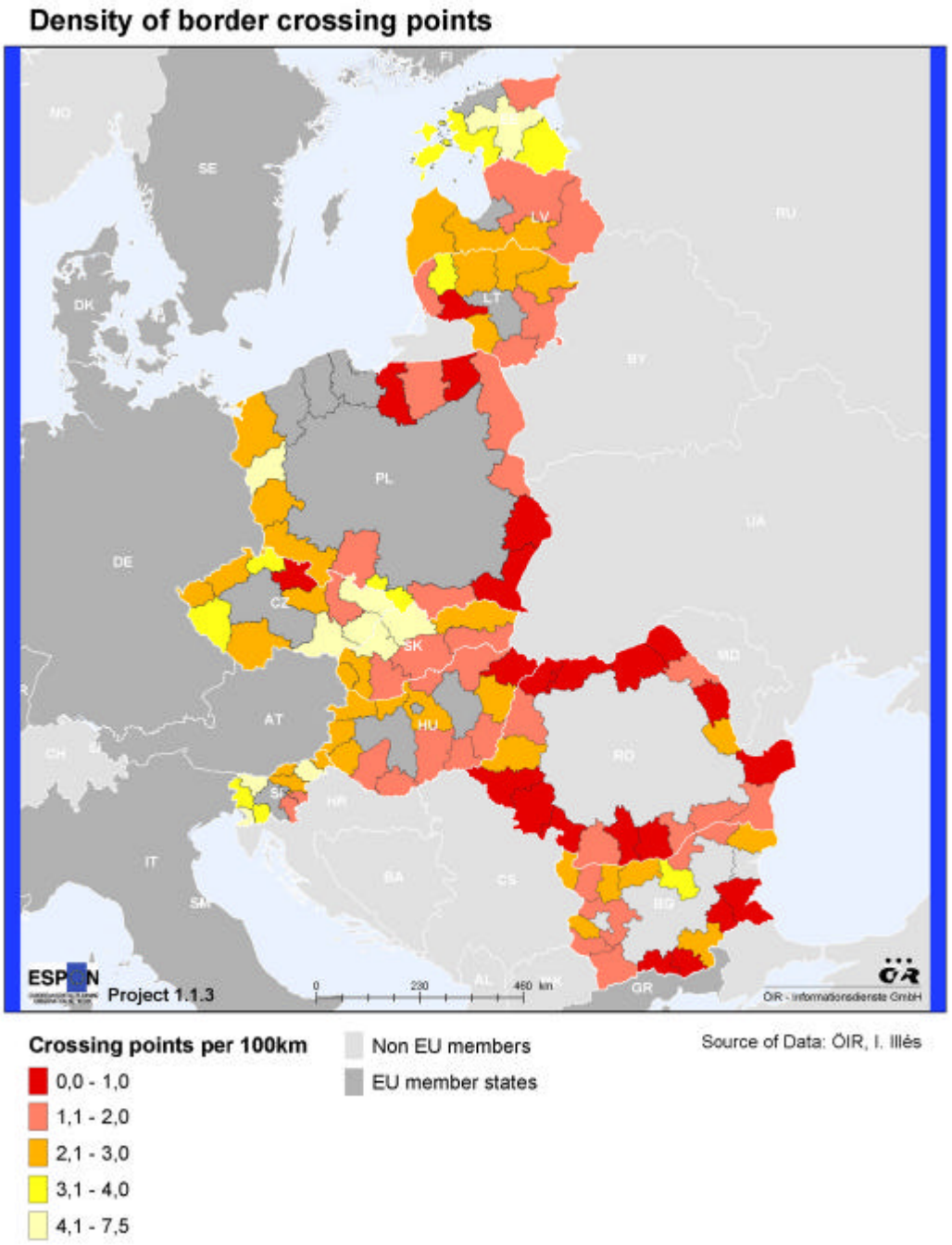


Table 4-13: Density of border crossings

	International road border crossing per 100 km of border length						More than 5
	Number of border regions	No internat. crossing	0-1	1,0-2,0	2,0-3,0	3,0-5.0	
BG	17	3	2	5	6	1	0
CZ	11	0	1	1	4	4	1
EE	4	0	0	1	0	2	1
HU	14	0	1	7	6	0	0
LT	9	1	0	3	4	1	0
LV	4	0	0	1	3	0	0
PL	15	2	2	5	3	3	0
RO	19	3	8	6	2	0	0
SI	10	0	0	2	2	3	3
SK	8	0	0	3	3	2	0
Total	111	9	14	34	33	16	5

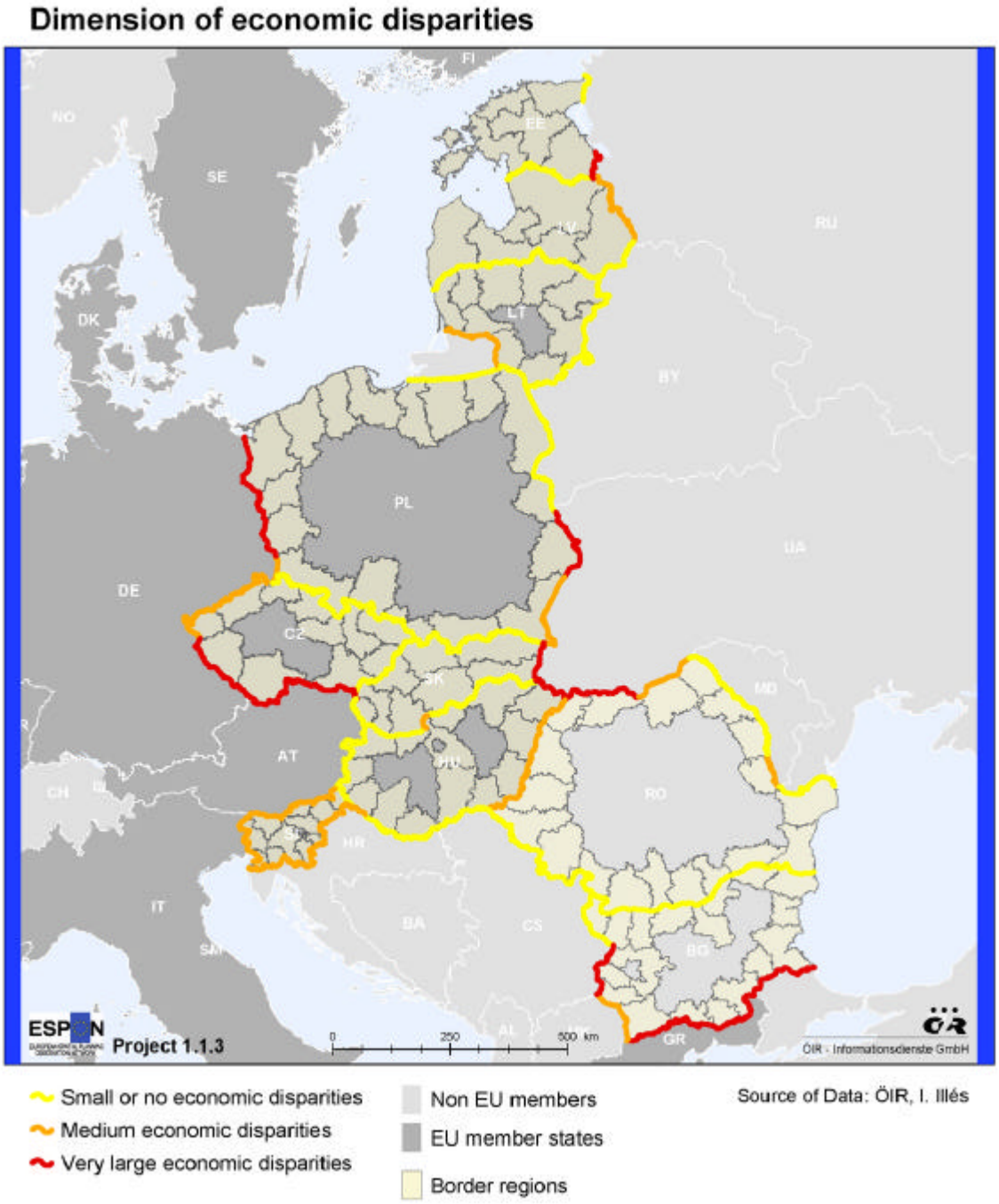
Even now, there are 9 NUTS3 regions in the enlargement area where there are no international border crossings: 3 in Bulgaria and Romania repsectively, 2 in Poland and 1 in Lithuania. The highest density of border crossings can be found – despite the unfavourable geographic conditions – in Slovenia. The lowest density of border-crossings are in Romania and Bulgaria.

4.3.1.4 Economic disparities

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[4].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. See Map 4-11 for the dimensions of economic disparities.

[4] Based on regional GDP data of EUROSTAT

Map 4-11: Dimension of economic disparities



4.3.1.5 Membership in Euroregions and transnational Working Committees

There are 118 border regions and 63 regional cross-border cooperation organisations (60 Euroregions and 3 transnational Working Committees) in the enlargement area. Euroregions are a type of bottom-up structure built by cross-border regions and offer a favourable organisational framework for project preparation, but perhaps their main significance it that establishing a Euroregion signals the intention to engage in cooperation. In the enlargement area the "density" of this type of organisations is even higher than in the Western part of Europe. Unfortunately, the actual progress in cross-border developments and cooperation is not always keeping pace with the development of the organisational framework. (Actually, there are Euroregions on some border sections where there is no international border crossing point in the region). The membership in the organisations is shown on the following table:

Table 4-14: Membership in transnational co-operation schemes

		Euroregions in the enlargement area						
	Number of	Membership in Euroregions				Membership in Working Committees		
	border	at least a part of the NUTS3 region is member in						
	regions	no	1	2	3	no	1	2
		Euroregions in the enlargement area						
BG	18	5	11	2	0	11	7	0
CZ	11	0	5	5	1	11	0	0
EE	5	0	3	2	0	5	0	0
HU	14	2	5	6	1	3	9	2
LT	9	1	7	1	0	9	0	0
LV	5	1	1	3	0	5	0	0
PL	19	0	16	3	0	18	1	0
RO	19	2	14	3	0	5	14	0
SI	10	0	10	0	0	0	10	0
SK	8	0	3	3	2	3	5	0
Total	118	11	75	28	4	70	46	2

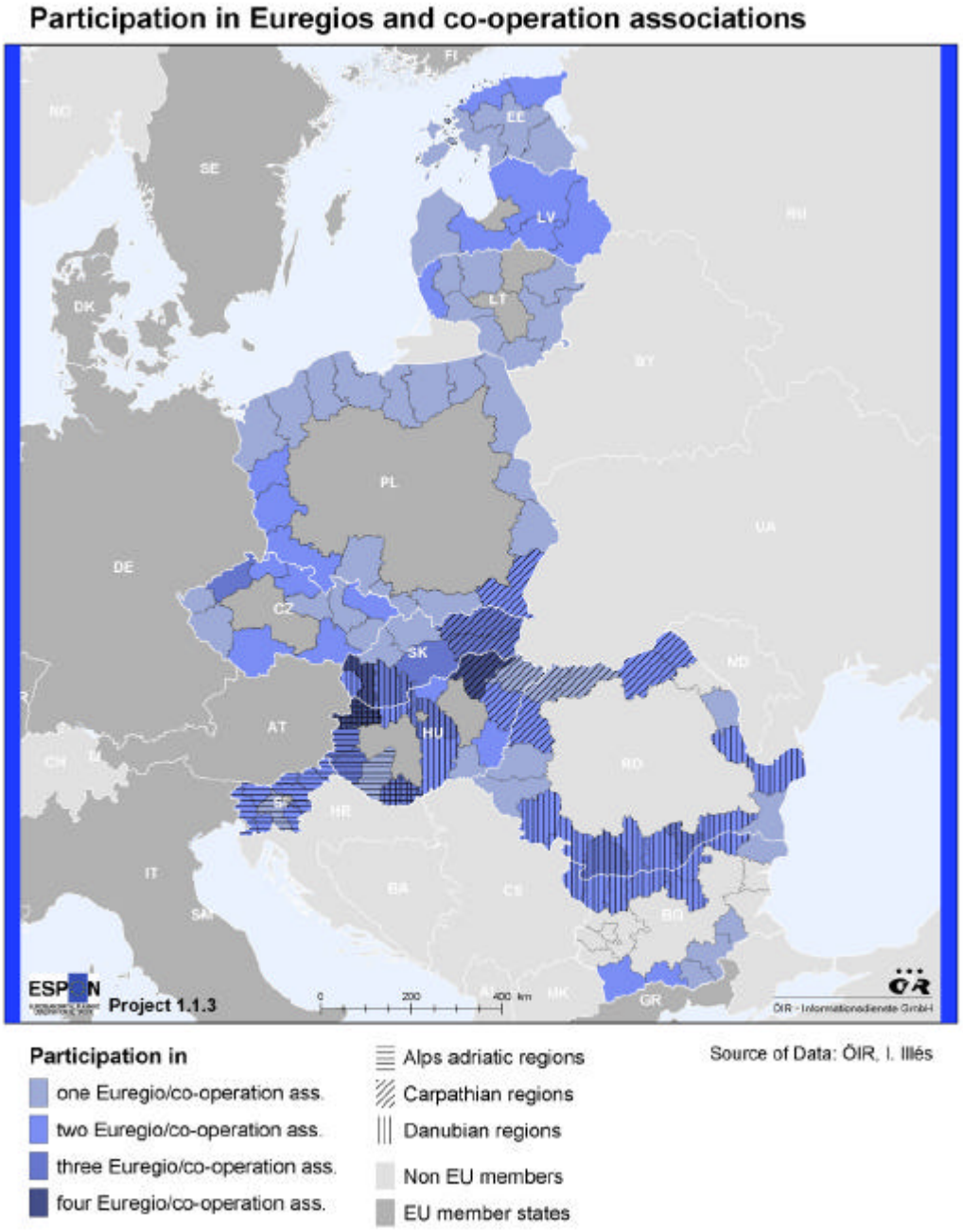
More than 90 percent of the border regions are members of one or more of these organisations (on the Table in Annex 4.1 the figure in parentheses refers to the serial number of the cross-border cooperation organisation in Annex 4.2). In the Czech Republic, Estonia, Poland, Slovakia and Slovenia, actually all border regions are members of one or more organisation. 28 regions are members in two, 4 regions in three organisations. It means that there are also overlapping Euroregion organisations, especially in the Baltic states and in Southeast Europe.

Working Communities are generally forums of collection, systematisation, dissemination and exchange of information and deal with the more "soft" aspects of regional cross-border cooperation. Membership in Working Communities (Arbeitsgemeinschaften) is less complete. The reason for this is, that there are only 3 such organisations in the Enlargement area, with geographically clearly defined activity areas: the Alps-Adriatic Working Community, the Danubian Regions Working Community and the Carpathian Euroregion. The name of the

letter is though Euroregion, but its size and activities can be clearly defined as Working Community.

Only four border regions are members in 3 Euroregions (Ústecky kraj in the Czech Republic, Borsod-Abaúj-Zemplén county in Hungary and the Banskobytricky and Trnavsky kraj in Slovakia) and only 2 regions are members of two Working Community, both in Hungary (Gyor-Moson-Sopron and Baranya counties).

Map 4-12: Participation in Euregios and co-operation association



4.3.2 Mapping the typologies

In order to present the results in a more comprehensible way they are drawn in maps of the border regions dealt with. First, the features concerning the single criteria mentioned above are shown. Finally, two versions of ´draft border typology for integration potential´ try to summarise the observed characteristics in different ways. This exercise is done without applying the first indicator surveyed, the ´number of neighbouring countries´, because it is not considered crucial for the integration potential. The indicator ´ethnic-historical type of borders´ is not applied in the integrated typology because of its ambiguity.

The rationale for the integrated typology is as follows:

Table 4-15: Dimensions and criteria

Dimensions	**Criteria**	
Starting position	Density of border crossing points	Intensity of transnational activities
Potential change	Geographic type of border	Economic disparities
	… applied in Version 1	… applied in Version 2

Table 4-16 and Table 4-17 show two different approaches (Version 1 and 2) of drafts of integrated types of border regions.

Table 4-16: Version 1: see Map "Draft # 1: border typology for integration potential"

Potential for change / **Starting Position**	**High:** Green border	**Low:** Mountain / River border
Good: High density of border crossing points	**Forerunners of integration**	**Hardworkers of integration**
Bad: Low density of border crossing points	**Candidates of integration**	**Handicapped for integration**

Map 4-13: Draft # border of integration potential

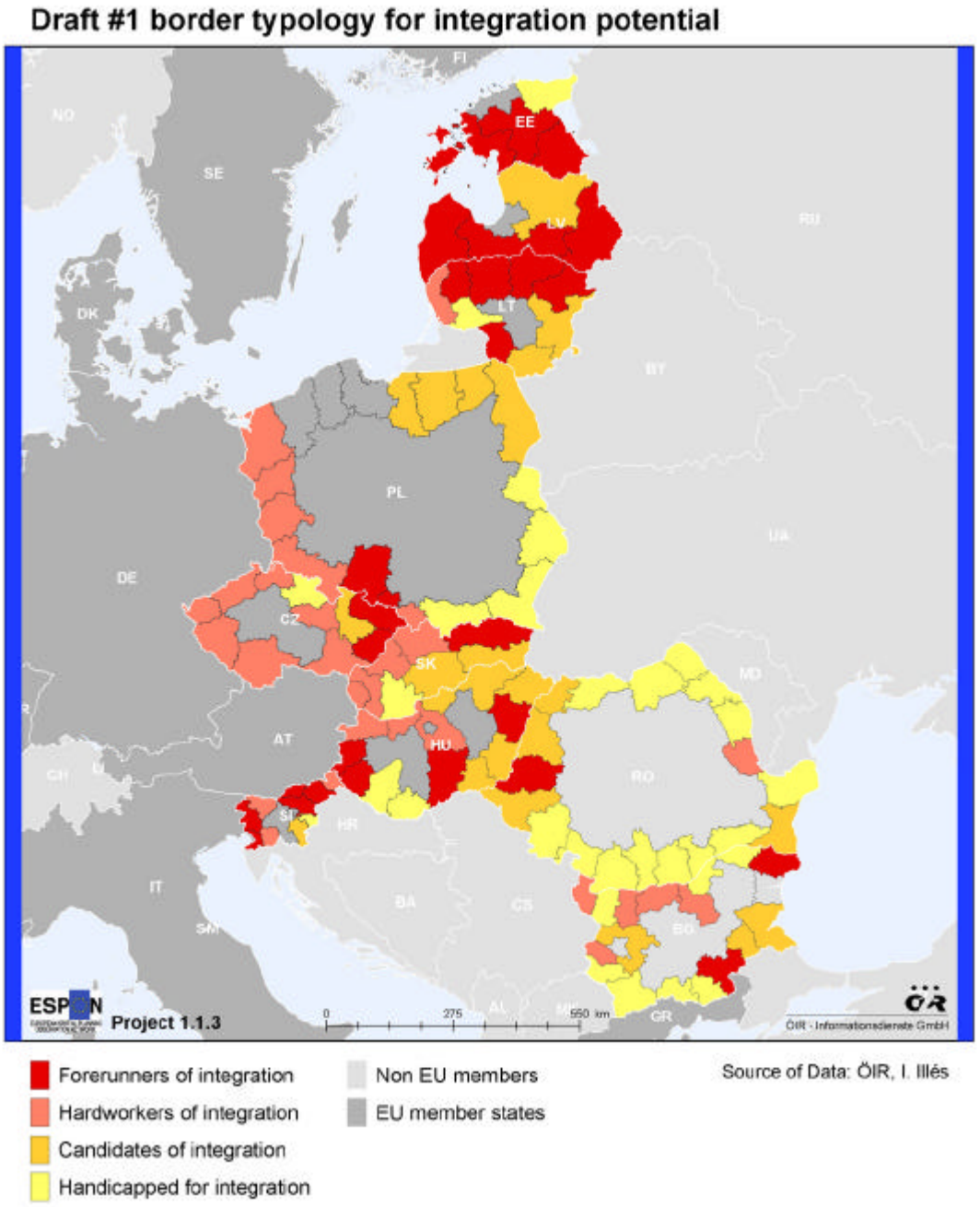
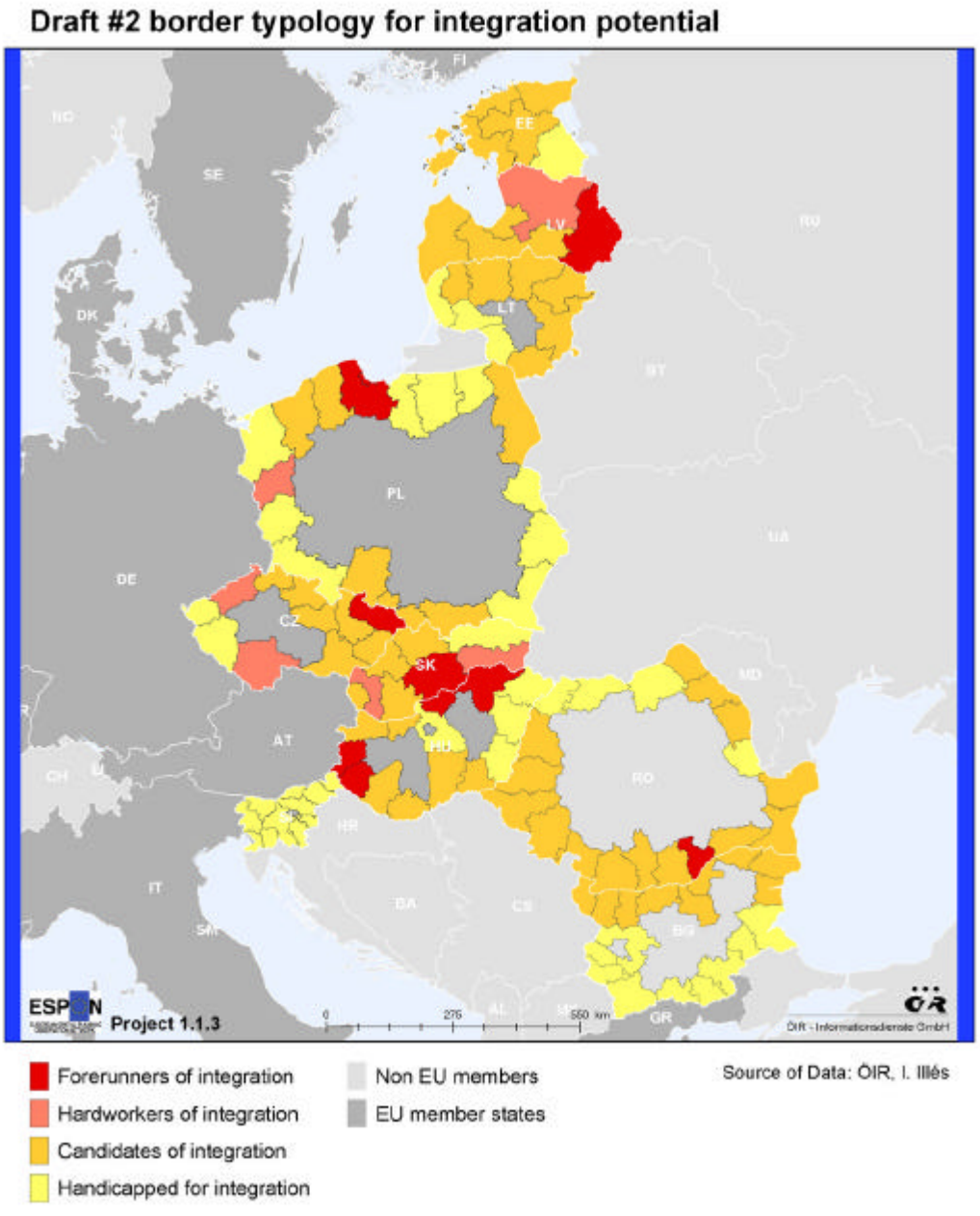


Table 4-17: Version 2: see Map "Draft # 2: border typology for integration potential"

Potential for change / Starting Position	**High:** High economic disparities	**Low:** Low economic disparities
Good: High number of trans-national activities	**Forerunners of integration**	**Hardworkers of integration**
Bad: Low number of trans-national activities	**Candidates of integration**	**Handicapped for integration**

Map 4-14: Draft #2 border typology for integration potential



4.3.3 Policy implications based on Integration potential typologies

In the "Version 1" typology in Map 4-13, which we could call "Flow accessibility", we see that quite naturally border regions that have "green" or easily passable borders with a high density of border crossings are Forerunners candidates of integration (integration here consisting of increased flows of goods, services, knowledge and cross-border cooperation and implicitly economic and social integration). Inter-regional export of goods is expected to be higher and the frequency of travel, for tourism or commuting, is facilitated. Those regions with low density of border crossings and generally less inaccessible borders are at the start Handicapped for integrative processes and flows. Hardworkers and Candidates for integration still have low density of border-crossings and more inaccessible borders to overcome.

In the "Version 2" typology in Map 4-14, which we could call "Capacity flow", we find that border regions with a good potential to change high economic disparities and a large number of transnational activities are Forerunners of integration in terms of flows of cooperation efforts, twinning schemes and/or capacity building measures. The potential for bottom-up efforts at the regional and local levels is significant. Those border regions with a low number of transnational activities and low economic disparities are "Handicapped" in finding suitable reasons and forums for cooperation. Since the level of disparity is low, but the number of transnational activities is high for the Hardworkers of integration, capacity-building projects are of less importance and cooperation schemes may focus on exchange of knowledge, best practices and experiences. The Candidates for integration may have good reason to engage in capacity building, but have not yet found the forums in which to do this.

Thus the Version 1 and Version 2 typologies implies that a range of policy interventions will have to be applied in varying doses and methods if the goal is to increase polycentric development. While it would be tempting to focus EU and national funding on the forerunners of integration border regions for their value-added aspects, this may do little decrease national region disparities. Regional and local policy efforts are needed in drawing to the attention of national and EU policymakers the needs for interventions in the "handicapped" cross-border regions, particularly those dealing with exchange of best practices border-crossing infrastructure.

4.3.4 Case studies of border regions

Elisabeth Vajdovich Visy

Because of the wide variation in border region types and the inability to gain hard data on various types of flows of people, goods, service and knowledge, this study will be enriched by in the Final Report by in-depth case studies of border regions lying along the (former) EU borders, border regions along the border between two new member states, border regions lying at the external EU borders in order to understand qualitatively the unique processes of

integration, the changes of border region position in the national development structure and the vehicles and barriers of integration for these regional types.

Background

Eight of the ten new member countries and two (or three, in case of Croatia) more to join the European Union are former Eastern European socialist countries. (Because of their insular location and small territory the border regions of Cyprus and Malta need not be identified – though the north – south political division of may be of interest to study).

The border regions of the formerly east European socialist countries were directly affected by the political division and now these regions occupy a special position in the development structure of the respective countries. The special characteristics follow from the factors below:

- the border regions were and are directly affected by the political and economic relations with the neighbouring country,
- the majority of the border regions had the opportunity to take part in interreg, cross border programs.,
- the border region of the EU member state lying at the outer border of the EU was and is also affected by this position.

Purpose

The purpose of the case studies is to demonstrate whether border location has effected the development potential of the region. If it has, what are the measurable results or processes, and what potentials (and/or threats) can be identified.

Types

Border regions of the new member states can be classified: as follows:

- border regions lying along the (former) EU borders
- border regions along the border between two new member states
- border regions lying at the external EU borders.

The case studies should be worked out at least for one border region of each type, because they represent differences in terms of development potential.

Structure

In the case studies analysis is proposed of the following:

- characteristics of the border region in the national context
- changes of the characteristics of the region over time (e.g. 1990-2004)

The proposed core indicators:

- population, density

- composition of population change
- in-, out-migration
- commuting
- educational level
- GDP/capita
- Economic structure: employment
- Occupational structure
- Types of industries (old vs new market economies)
- Land-use change
- nature conservation
- environmental quality
- transport infrastructure, flows

Indirect indicators:

- barriers:
  - natural barriers
  - political, historical barriers
  - infrastructure shortages
- links, cooperations:
  - cross-border schemes
  - inter-municipality cooperations
  - joint environmental/nature conservation schemes

By means of these indicators the case study will focus on the following:

- process of integration
- changes of the position of the border region in the national development structure
- vehicles and barriers of integration

5 Scenario Studies - Spatial Effects of the Enlargement of the European Union 2004-2021

In this chapter the methodologies for examining the regional and spatial effects of the enlargement of the European Union on the development of GDP, sectoral structure, trade, investment, employment, population and migration flows on the regions in the new member states, in particular least favoured regions and border regions, are discussed and demonstrated in preliminary examples.

To forecast the effects of enlargement, two scenario studies are conducted in ESPON 1.1.3 using two different but complementary forecasting models of regional socio-economic development:

- The RESSET model used in Scenario Study 1 is a new model which is designed primarily for ESPON 1.1.3. It is a sketch planning model which enables any casual user with a view about the future urban and regional development of the ESPON space to engage in information speculation: to explore the scenario space.

- The SASI model parallelled used in ESPON 2.1.1 is a model of regional socio-economic development particularly designed to show the impacts of European transport policies.

The two models are made as much as possible comparable by using a harmonised spatial database and similar assumptions about the overall economic and demographic development of the enlarged European Union as a whole.

The scenarios to be simulated with the two models will be defined in close co-operation with other ESPON projects, in particular the spatial scenario project ESPON 3.2. In this report preliminary results based on first tests of the models or, in the case of the SASI model applications simultanously reported in ESPON 1.1.3 and 2.1.1. The chapter will close with a perspective on comparing the results of the two models and possible policy conclusions.

5.1 Scenario Study 1

Mike Batty

5.1.1 The RESSET Approach

The scenarios generated by the **RESSET** Model (**RE**gional **S**cenario **S**imulations for the European Territory) are quite different in conception from those produced by **SASI**. **RESSET** is a sketch planning model that enables the user to very quickly test a scenario at different levels of detail by specifying different scales of change in population, employment, and accessibility. Whereas **SASI** is a large scale simulation model which is operated by professional model builders, **RESSET** is a sketch planning tool that is tiny in comparison, being delivered to any user over the net and designed to be run over and over again to generate a sense of the future development of Europe rather than very detailed result at the subregional level. A demo

version of the model is available at http://www.casa.ucl.ac.uk/RESSET.zip[1]. The model will continue to be developed throughout the rest of this project and the description that follows outlines its core and the preliminary pilot. Users are forewarned that the software is rudimentary with error checking not in place although the user friendly interface to this kind of sketch planning is a well established feature of our approach to generating scenarios, thus nicely complementing the **SASI** model in terms of detail and scale.

RESSET simulates change in the European space at three levels: first at the entire EU29 level (EU15+CH+NO+AC12) which involves a demo-economic forecasting model of the 29 countries based on extrapolation of population and employment under various plausible scenarios about aggregate growth rates – fertility and mortality, net migration and economic development. This model is one that forecasts **DE**mographic and e**CO**nomic activity aspatially in Europe with respect to global and regional issues and we refer to this as the **DECO** submodel. The second model which we refer to as the **CORE** of the system is a submodel that is a spatial simulation of growth and change in population and employment at the country level but is informed by accessibilities and relative **CO**untry/**RE**gion level attractions. The third model is a disaggregation of **CORE**, referred to as URAL, which involves simulating an apportionment of **UR**ban and ru**RAL** growth/change from the country level to the NUTS3 regions. This model is also a spatial accessibility-based model but it effectively moderates the forecasts made at the two higher levels by factoring in urban and rural differences as well as the unevenness of national development.

These three models are being closely integrated and they are designed to pick up detail at the three different scales which cannot be handled satisfactorily at any one single scale. Therefore iterations between them are essential to establish equilibrium and consistency between their predictions. In essence, aggregate totals are forecast by **DECO**, and then these totals are distributed to the country level using the aggregate accessibility-style model **CORE**. These country level estimates then form the control totals for the much more detailed model **URAL** which works at the NUTS3 level. This model effectively simulates urban and regional development incorporating many more physical constraints than at the upper levels. However the totals that are generated can be different at these lower levels and this in turn necessitates iteration between the levels In short, although the model system begins at the aggregate **DECO** level, in practice all these levels are of equal importance and this is established through the iterative structure, which we show in Figure 5-1.

[1] This can be downloaded in seconds, as it is only 280KB. When unzipping, users must ensure that the model ***RESSET.exe*** is in the same folder as the data set ***RESSET-data.csv***.

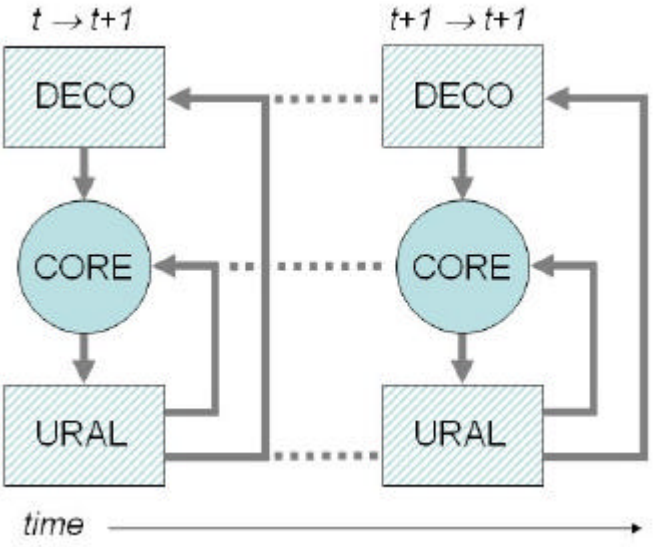


Figure 5-1: The Three Level Model Structure (hatched components yet implemented)

Unlike **SASI** which has been under development for a year or more, this model is entirely new, conceived for ESPON 1.1.3 and has not been presented before. We therefore need to explain its structure and calibration to data in a little more detail than **SASI** so that readers grasp the progress we have made and the work still required in the rest of this project.

5.1.2 Application of the CORE Model

The Structure of the Model

So far, we have developed the CORE model and this is still in pilot form. The model is based on two functional relations, the first predicting demographic-population levels, the second economic-employment levels, both determined by functions of relative accessibility and both having various loops within their structure which incorporate the usual feedbacks between demography and economy. We can divide the variables in this model into four different types

- truly exogenous, reflecting changes in the environment that are not usually driven by policy
- policy variables which are exogenous but determined by the user
- truly endogenous which are those which are traditional dependent variables
- exogenous-endogenous variables lagged in time or determined simultaneously which are both predictors and predicted by the model.

The typical form is as follows where $P_i(t)$ is some measure of demography at time t, while $E_i(t)$ is some measure of economy at the same time period, both variables being measured in zones i which are NUTS0. These variables are lagged in time at $t-1$, $t-2$ and so on, and

form the endogenous-exogenous set. Truly exogenous variables are called $X_i(t)$ and the accessibility variables are defined directly as mixtures of $P_i(t)$, $E_i(t)$, and connectivity between zones i and j called $c_{ij}(t)$,. Parameters of the model equations are given by lower case Greek letters a, b, and so on. Policy variables are defined as $Z_i(t)$. We can state the generic form as follows:

$$\left.\begin{aligned} P_i(t) &= a_1 P_i(t-1) + a_2 E_i(t) + a_3 X_i^p(t) + a_4 Z_i^p(t) + a_5 \sum_j \frac{E_j(t)}{c_{ij}(t)} \\ E_i(t) &= b_1 E_i(t-1) + b_2 P_i(t) + b_3 X_i^e(t) + b_4 Z_i^e(t) + b_5 \sum_j \frac{P_j(t)}{c_{ij}(t)} \end{aligned}\right\},$$

where the various leads and lags in the equation structure reflect the way the model is solved. Essentially there is a good deal of simultaneity in the structure because we consider that the time periods for which the model will be operated are long – 5 years and during this period, the two sectors interact to mutually determine each other. The way the model is to be solved involves beginning with variables at time $t-1$ and then iterating on the above equation structure until convergence. Truly exogenous variables $X_i^p(t)$ and $X_i^e(t)$ might be employments or populations that remain fixed or infrastructures that are unchanging or at least not changeable within the model. Policy variables $Z_i^p(t)$ and $Z_i^e(t)$ can act as dummies switching the relevant variables on and off for example. So far we have only implemented the exogenous variable inputs, not the dummies.

This model can be pictured in block diagram form as follows where the loops indicate how variables influence one another. In any kind of forecasting model which is to predict how different localities might converge or diverge in terms of structure or in which there is considerable interaction between the sectors, this kind of structure is essential.

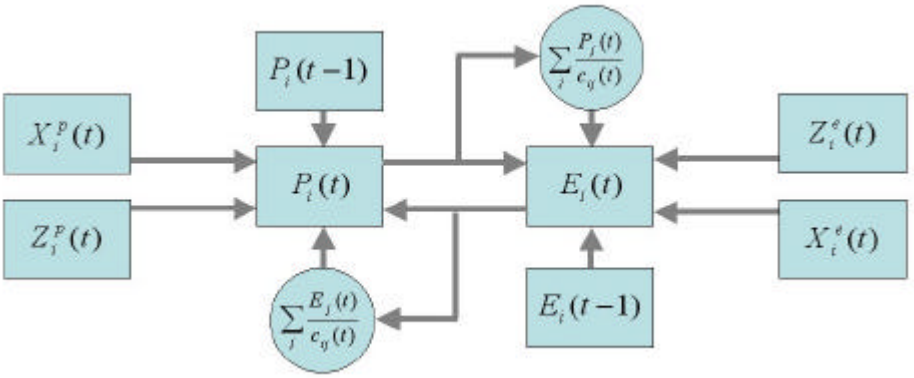


Figure 5-2: The CORE (Country-Region) Model Structure

The model is more like a simulation tool than an econometric structure thus enabling us to intervene in the models operation somewhat more easily. However the structure we will adopt is similar to many of the original forecasting models that are being developed of the European space economy in that there is a strong spatial element captured through the accessibility potential functions.

Unlike many European forecasting models such as those being developed at Cambridge Econometrics (see Gardiner, 2003), we do not intend to predict economic variables per se. Our model is more physical predicting employment and population and in this sense, our focus is on the spread of population and the location of employment with the potential terms within the model serving to capture issues concerning diffusion. The convergence criteria which is part of many regional econometric models usually refers to monetary data, to incomes and productivities for example, and in this context, we avoid such predictions. The spread of population, for example, might be a proxy for convergence and the model also aims to capture the long-standing characteristic of the richer regions within poorer countries benefiting the most from European integration. However our model is designed to be more of a policy tool to show the effects of changing accessibilities and interventions with respect to economic activities rather than an economic forecasting tool per se.

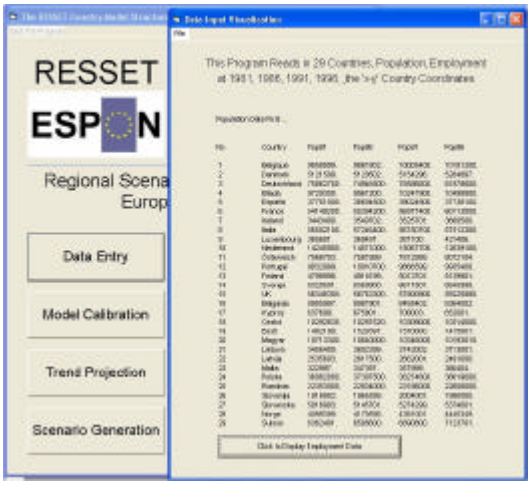
The Pilot Implementation

CORE is written in Visual Basic and as noted above, it comes into its own when it is used over and over again, with the user testing scenario after scenario. Currently it is highly aggregate but as it develops, it will become more compute intensive. It is divided into four stages:

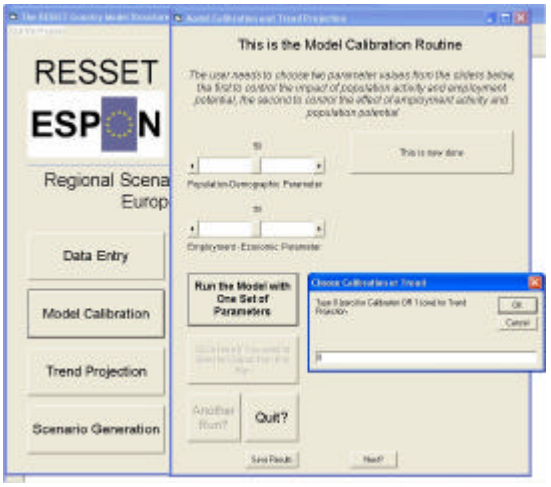
- reading in and examining the data,
- calibrating the model by choosing parameters controlling the relative weights of the population and employment sectors,
- running the calibrated model into the far future to assess the equilibrating properties of the European space and long term trends, and finally
- scenario assessment which involves inputting various exogenous variables as indicated above. The main interface is illustrated in Figure 5-3

Figure 5-3: The CORE Model Structure of RESSET

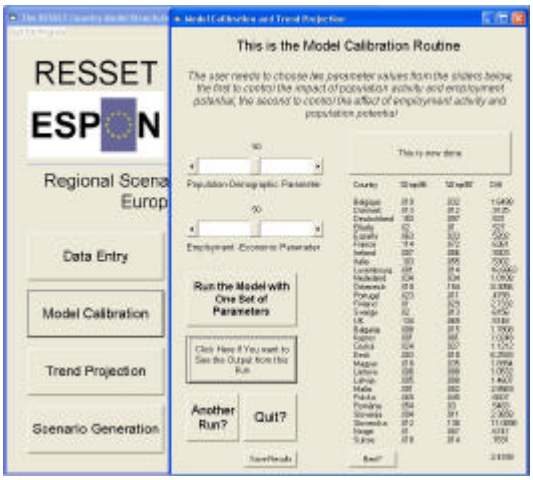
The user clicks on each of the stages in order and a typical sequence is illustrated in Figure 4 where the progression is self-explanatory. Readers are encouraged to download the GUI from http://www.casa.ucl.ac.uk/RESSET.zip and play with it as this is the whole purpose of this kind of scenario generation.



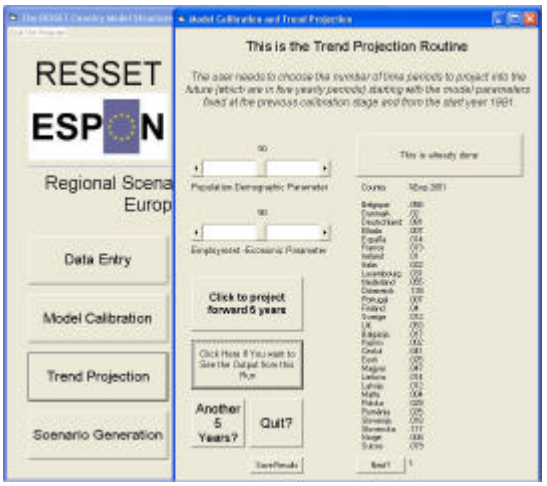
Stage 1: Data Entry, Display and Checking



Stages 2 & 3: Calibration or Trend Projection



Stage 2: Calibration: Choosing Parameters



Stage 3: Trend Projection to the Long Term Future

Figure 5-4: Stages in the CORE Model

5.1.3 Examining the Data, Calibrating the Model

Although our data is the same as that used in the SASI model, we are concerned about its aggregate accuracy. For example, total population in the 29 countries (EU15 + CH + NO + AC12) at 1981, 1986, 1991 and 1996 grows as expected from 468 to 474 to 483 to 489 millions but employment peaks then declines from 193 to 195 to 204 and then down to 195 millions again. We need to get a better grasp on the quality of this data before we launch into more detailed projections later in the study.

Notwithstanding data problems, we have run a simplified version of the model whose equation structure is

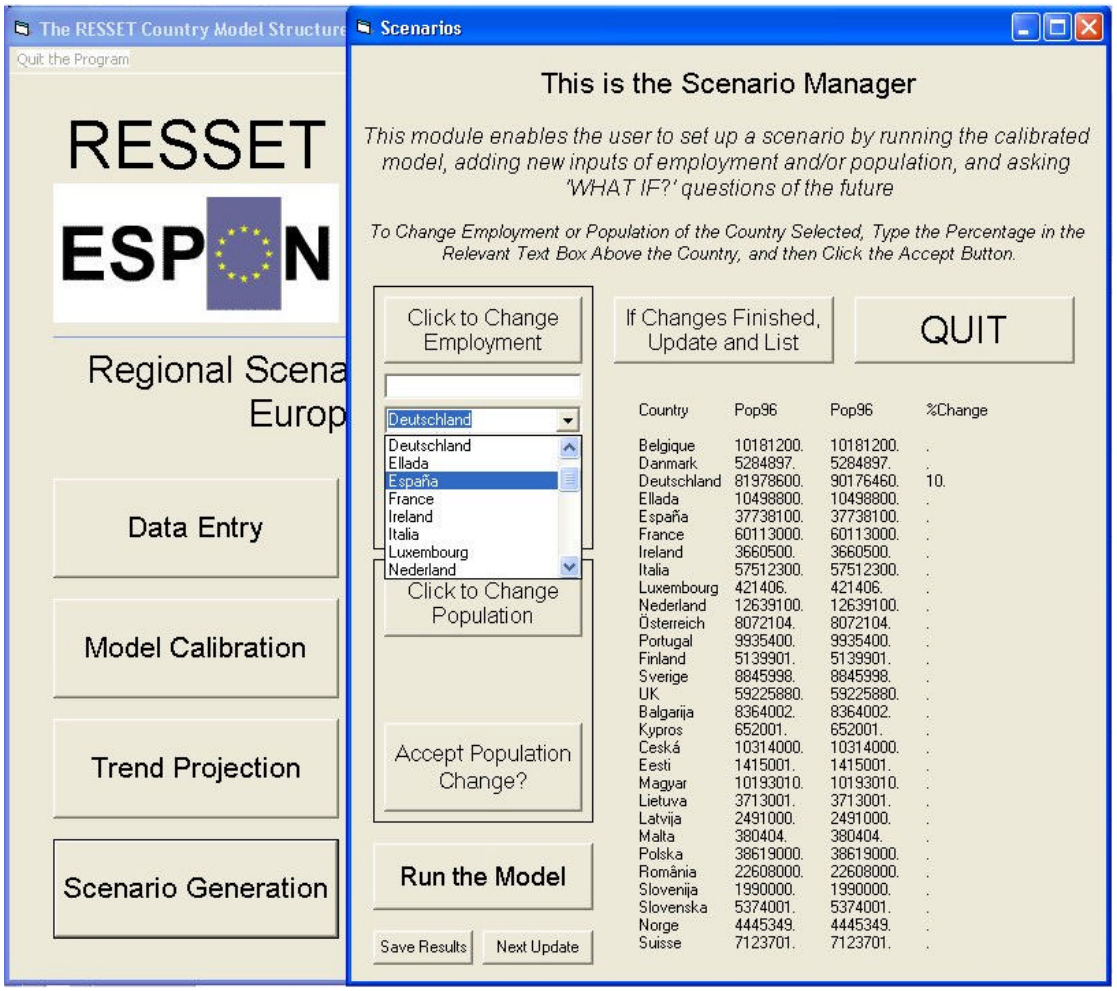
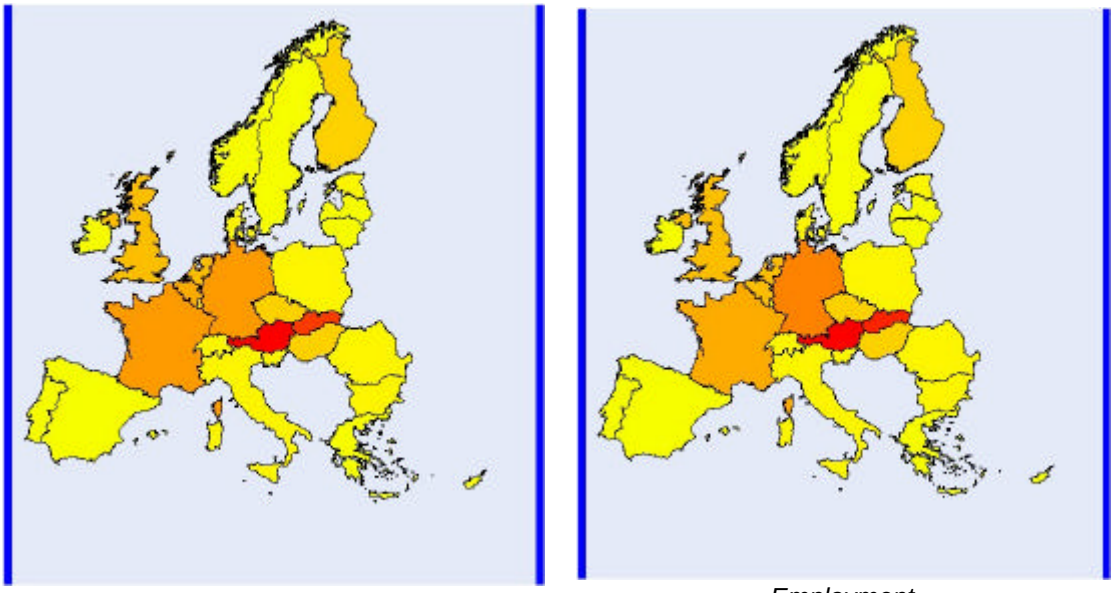


Figure 5-5: Generating, Running and Displaying Scenarios

$$\left.\begin{aligned} P_i(t) &= P_i(t-1) + a\ E_i(t-1) + (1-a)\sum_j \frac{E_j(t-1)}{d_{ij}^2(t-1)} + d(p)X_i^p(t) \\ E_i(t) &= E_i(t-1) + b\ P_i(t-1) + (1-b)\sum_j \frac{P_j(t)}{d_{ij}^2(t-1)} + d(e)X_i^e(t) \end{aligned}\right\}$$

where we now have two parameters to calibrate (based on a model with two equations in two unknowns) with the dummies $d(p)$ and $d(e)$ set equal to 0 at calibration and used to inject population and/or employment into various locations as the basis for future scenarios. In fact this model system can become degenerate if a and b are set to zero as population collapses into employment and vice versa. Thus accessibility potentials are the key to the simulation. Moreover to account for absence of links to the higher level **DECO** model which gives total populations and employment, the **CORE** model is based on predicting population and employment shares where $\sum_i P_i(t) = 1$ and $\sum_i E_i(t) = 1$. Suitable scaling of the model equations ensures that this is the case after each temporal simulation.



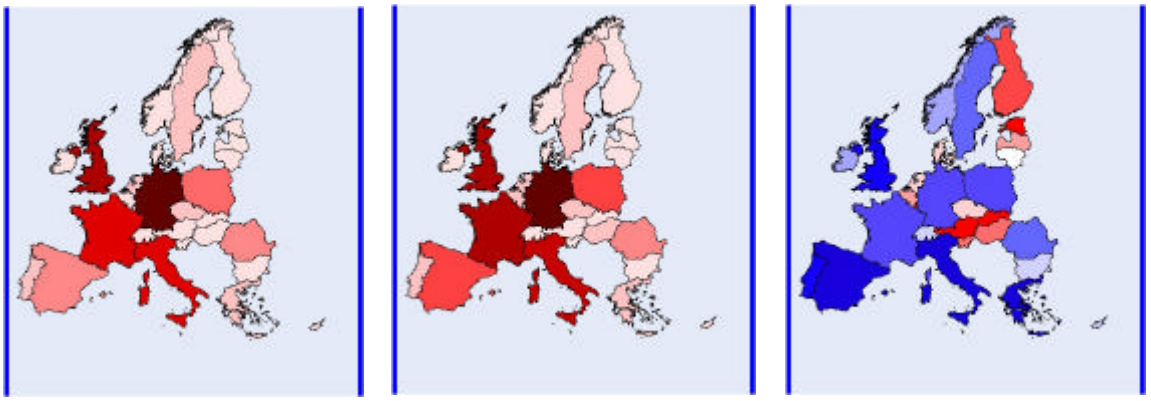
Population *Employment*

Figure 5-6: Accessibility Potentials 1981

As potentials have such an important role in the model, we show those computed for the start of the calibration period (1981) in Figure 5-6. What is immediately clear is that these potentials are biased to the areal core of the ESPON space. This is not so surprising but what it does imply is that this core will be much favoured in any projections with these models. As the model interface allows us to test a wide range of combinations of the parameters a and b (see Figure 5-4), we have chosen a set of parameters to work with which give accessibility a significant role $a = 0.75$ and $b = 0.25$ while ensuring a near optimal fit. Examining the calibration results shows immediately that

- population and employment are under-predicted in countries with the largest populations and employments
- the western European heartland as well as the north-western, west and southern peripheries tend to under-predict while the central Austrian corridor and eastwards over-predicts
- smaller countries in area tend to over-predict

These results are shown in Figure 5-7. A word about all the maps is in order. We do not intend to give specific predictions in terms of values at this stage. Like in the SASI model, we are concerned with shifts and differences. In general in calibration in Figure 5.6, blue shows a lesser share than observed, red a greater share in terms of the difference map. We also urge caution at this stage with respect to our definitions of potential in that we have used a distance adjacency matrix which is between capital cities and we are yet to fine tune all this to take account of intraregional differences. Of course in the final model system such potentials will be taken from the lower level URAL model which will work at the NUTS3 level.



Employment Share 1996 *Population Share 1996* *Ratio Fit of Model 1996*

Figure 5-7: Activity Shares and Calibrated Model Fit at 1996

5.1.4 Preliminary Model Scenario Results

Trend Scenarios

If you refer back to Figure 5-4 which shows the various stages of the model, then a key stage following calibration is to project the calibrated values into the medium and long term future. This will give some idea of where the system is heading. In a sense, what it will show is a kind of long term equilibrium if the ESPON space were as mirrored in the model. We know that this can never be the case as the model is extremely crude and does not take account of any rest of the world sector. The calibrated model is a little bit like treating Europe as an entirely closed, homogeneous system, and it is fairly obvious that in this case, there would be a restructuring towards its areal centre as implicit in the potentials in Figure 5-6. In fact this presents rather a nice contrast with the scenarios we intend to illustrate here which are ones in which exogenous growth is injected to counter such introversion of development.

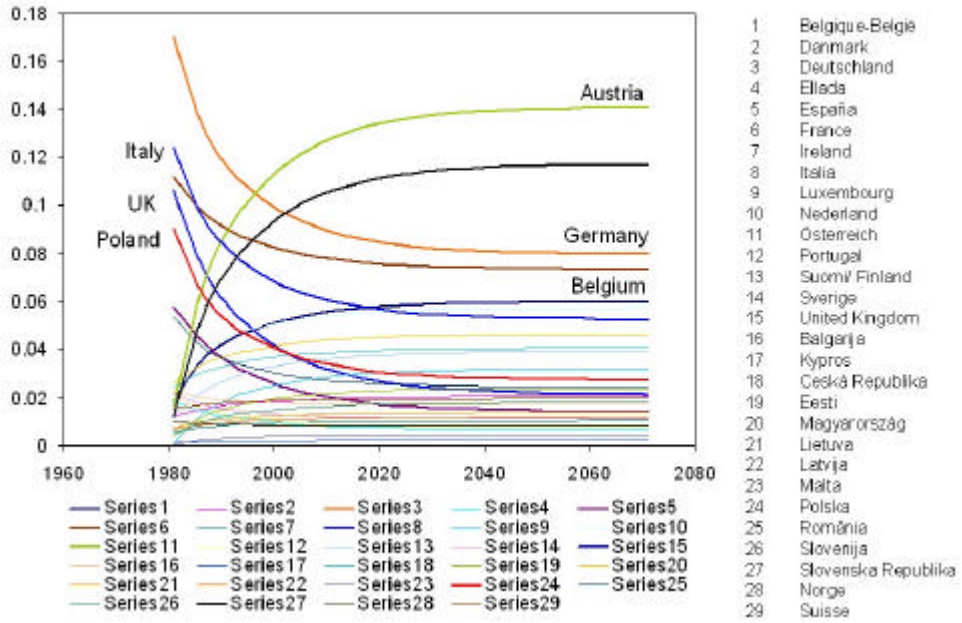


Figure 5-8: 100 year + Trend Scenario: The Very Long Term Redistribution of Employment Activity

Nevertheless, what we have done is to show what this future will look like. In Figure 5-8, we show what happens to employment when we project forward into the very long term future. This is more than 100 years into a future that redistributes everything according to the calibrated model. This has no inertia whatsoever. Basically the patterns noted above reinforce themselves although the growth of the central Austrian belt, and the decline of Italy, UK, Germany and France, all stabilise as expected in this kind of model. This is the implication of a closed Europe with no barriers to movement and a completely mobile population. All we can take from this is that this is the trend in the absence of any other drivers of development. It is a world where smaller countries get bigger and larger get smaller in terms of shares. In a sense, this is a picture of a regional bloc diffusing and diversifying as activity spreads, notwithstanding the fact that the picture is still pretty uneven in the long term steady state.

We show pictures of absolute activity volumes and shifting shares for employment and population in Figure 5-9.

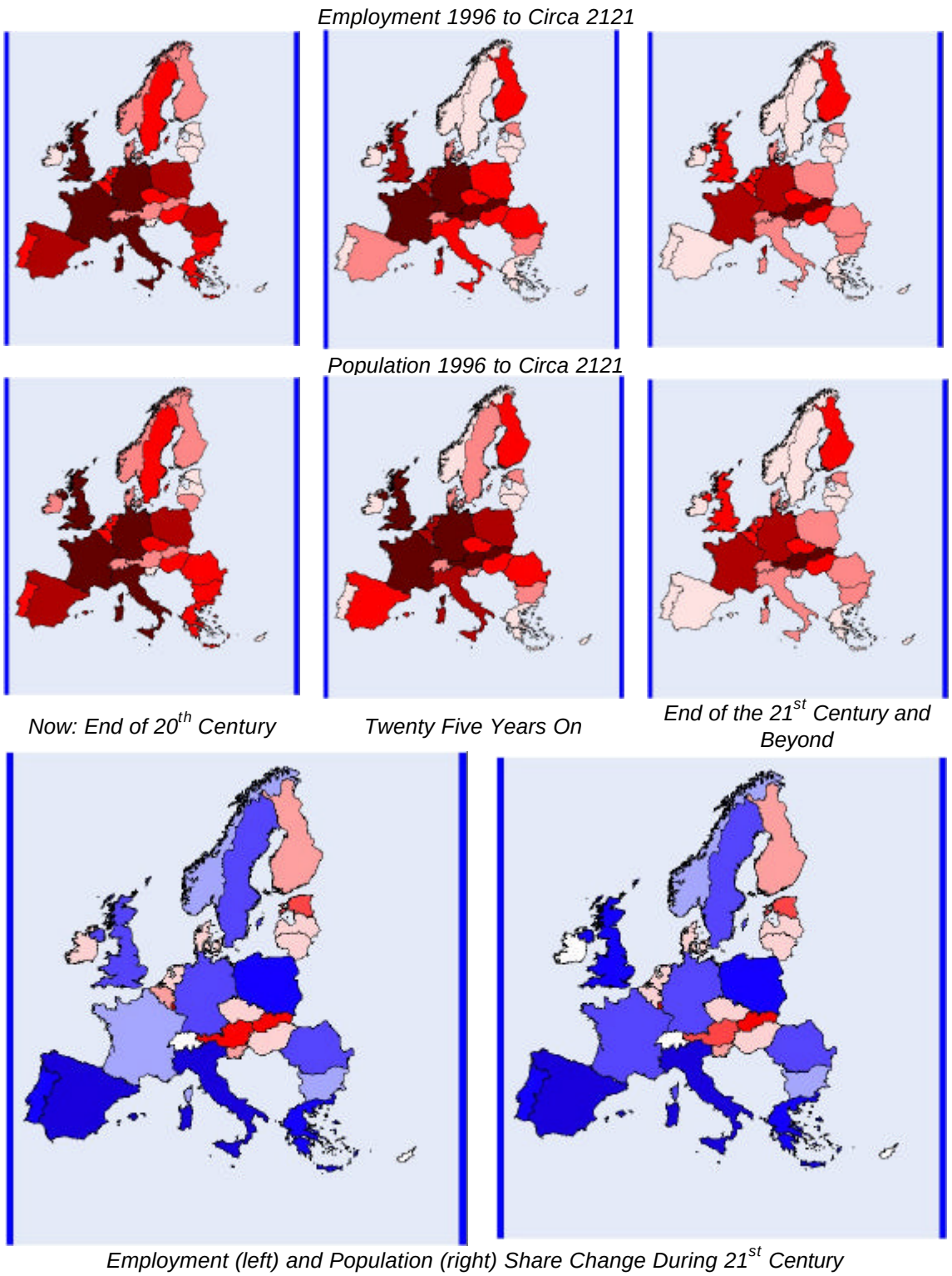


Figure 5-9: Very Long Term Trend Projections in the ESPON Space

Examples of 'What If' Scenarios: Sampling the Scenario Space

We have defined three major and somewhat radical long term scenarios which we list as follows:

- Policies to move jobs from western Europe to the east: injections of employment at levels of 15% or more in the key eastern countries of Poland, Czech, Slovakia, and Hungary. This we assume is a consequence of a declining agricultural base and the need for subsidy to bring employment levels back up.
- The natural growth of western Europe, particularly the Low Countries, UK, France and Germany from East Asian and North American investment, presumably in financial services and related tertiary, quaternary and quinary sectors, adding 15% to employment levels.
- The growth of the south in terms of migrating population to Greece, Spain, Portugal and the islands, adding 15% to these population levels.

We have run Stage 4 of the model (see Figure 5-5) using these assumptions which imply an injection of increased shares to the appropriate countries. Note that the Scenario Manager is actually designed to receive data in the form in which these scenarios are predicated. Note also that as yet we have not implemented any changes in interaction potentials related to accessibility largely because at this stage we consider the **SASI** model to be much superior in this regard. Our role with **RESSET** we believe is to generate 'off-the-wall' thinking about the future and to use this model to inquire about radical alternatives. In time we will temper all this to meet the constraints imposed by feasibility and uncertainty crucial to the project.

We have not yet analysed the detail of these scenarios other than in crude map terms and in terms of percentage changes for the same large blocks used in the SASI model results below. In terms of spatial distributions, the injections of employment and population lead to increases in their equivalents as expected but the spatial spill-over effects are largely confined to the Scandinavian and Baltic Republics and south east Europe in all cases. In fact, accessibility does not impact very greatly in terms of spreading these relevant benefits as Figure 5-10 implies

15% Employment Increase in East | *15% Employment Increase in East* | *15% Population Increase in Mediterranean Areas*

Figure 5-10*: Percentage Differences from the Trend Scenario Due to Exogenous Investments as Specified*

The last analysis we will produce here shows the impact of these changes on four different regional blocks. In Table 5-1, we show the percentage gain or loss over the steady state share for each scenario for the following three regions: EU15, CH+NO, AC12 which compose the entire 29 country ESPON Area.

Scenario	EU15	CH+CO	AC12
Eastern Growth	0.53 0.53	2.19 2.19	0.52 0.52
Western Growth	0.42 0.43	1.88 1.91	-1.50 -1.52
Southern Migration	-0.18 -0.18	-0.82 -0.81	0.56 0.56

Table 5-1: Percentage Shifts in Activity Shares Due to Investment and Migration first row is employment, second row is population

Table 5-1 shows that the shifts are quite small with the western growth having the biggest impacts on the west itself and on CH+CO. In fact it would appear from these impacts that it is more difficult to generate spill-over effects in the eastern than the western or southern regions of the EU but that the non-EU members benefit most from any investment in jobs in the west or east. These results are highly tentative and in the spirit of the model we are developing, we consider that these sorts of informed speculation on the future must be the basis for considered discussion, no more and, of course, no less.

5.2 Scenario Study 2: Impacts of the TEN-T and TINA projects on the regions in the new member states

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 been addressed 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 will be the regional economic model SASI used already 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 after their entry into the European Union taking account of the expected reduction of border barriers, such as waiting times and customs procedures and of different scenarios of implementation of the TEN-T and TINA projects.

5.2.1 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 and GDP per capita. 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 and polycentricity indicators expressing the impact of transport infrastructure investments on the polycentricity of national urban systems 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. 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 spatial development objectives of the European Union.

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). 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 TEN-T and TINA planning documents.

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 5-11: The SASI model visualises the interactions between these submodels.

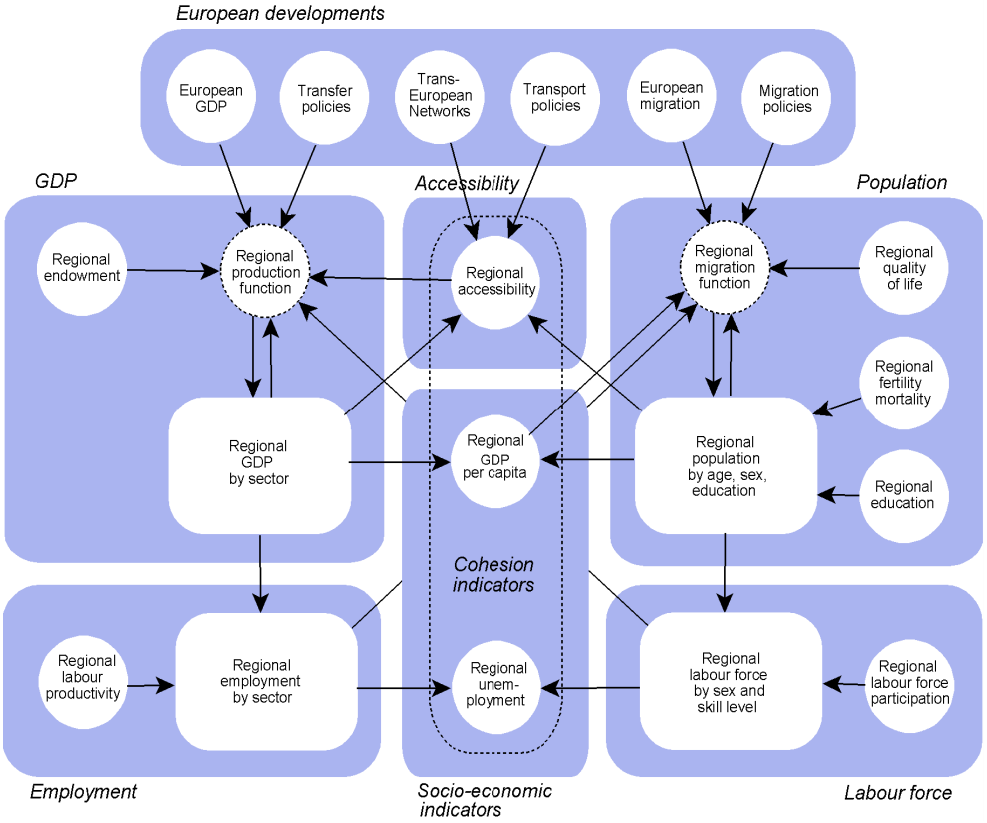


Figure 5-11: The SASI model

The *spatial* dimension of the model is established by the subdivision of the European Union and the twelve accession countries in eastern Europe plus Norway and Switzerland in 1,321 regions and by connecting these regions by road, rail and air networks. 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, i.e. 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 calibration for ESPON can be found in the Final Report of ESPON 2.1.1.

5.2.2 Preliminary model results

In ESPON 2.1.1 thirteen transport policy scenarios were simulated with the calibrated SASI model. Here, as a preview of the kind of information to be expected from Scenario Study 2, the results of two of them of special relevance for the new member states are briefly presented:

- *Scenario B2*: All TEN and TINA projects 2001-2021. Scenario B2 assumes that in the period 2001-2001 all designated TEN-T and TINA transport infrastructure projects are implemented as documented in the latest revisions of the TEN-T and TINA programmes (European Commission, 1999; 2002; 2004 and TINA, 1999; 2002).

- *Scenario B5*: TEN/TINA projects only in the cohesion/accession countries 2001-2021. Scenario B5 assumes that political emphasis is given to transport infrastructure projects in the cohesion and accession countries at the expense of projects in the European core.

More information on these two scenarios can be found in the Final Report of ESPON 2.1.1. In addition, a third scenario assuming the implementation of an extended list of transport infrastructure projects in the accession states was simulated:

- *Scenario B6*: All TEN projects and an extended list of TINA projects 2001-2001. This scenario was proposed by Tomasz Komornicki and Piotr Korcelli in the EU 5th Framework project IASON (Bröcker et al., 2004).

All three scenarios are compared with a Reference Scenario in which it is assumed that no new infrastructure projects are completed after 2001.

The results presented are preliminary because important model extensions necessary for modelling the spatial impacts of enlargement, such as regional subsidies, regional tax competition and the effects of national migration constraints are not yet implemented in the SASI model.

Accessibility

Table 5-2 shows summary results for accessibility of the three scenarios. The numbers are differences between the policy scenario and the Reference Scenario in 2021 in percent for the old EU member states (EU15), Switzerland and Norway (CH+NO), the twelve accession countries, i.e. the ten new EU member states plus Bulgaria and Romania (AC12) and the ESPON Space as a whole (EU27+2). Figure 5.2 shows the temporal development of accessibility averaged over EU15 and AC12 between 1981 and 2021. Figure 5-12: Development of accessibility rail/road/air, travel in the old EU member states and in the accession countries 1981-2021shows the spatial distribution of accessibility (rail/road/air, travel) in the Reference Scenario and the impacts of the three infrastructure scenarios.

Table 5-2: SASI model: accessibility rail/road/air, travel

Scenario		Accessibility difference between policy scenario and Reference Scenario (%)			
		EU15	CH+NO	AC12	EU27+2
B2	All TEN/TINA projects	+13.04	+12.55	+19.75	+14.18
B5	TEN/TINA only in cohesion countries	+2.23	+1.22	+8.53	+3.29
B6	TEN/TINA + maximum TINA projects	+15.59	+14.53	+34.43	+18.81

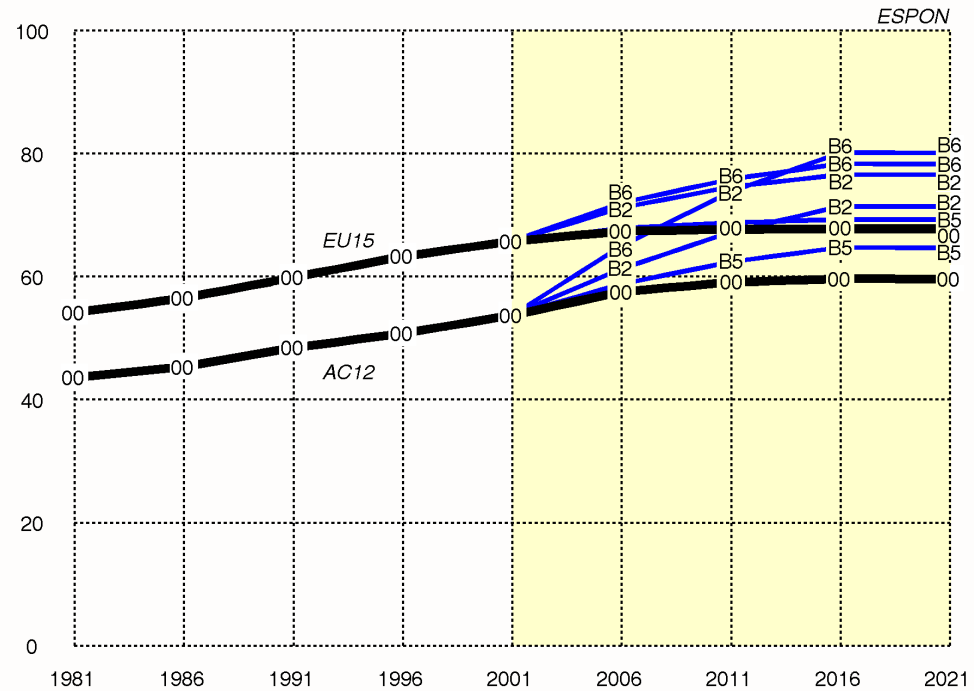


Figure 5-12: Development of accessibility rail/road/air, travel in the old EU member states and in the accession countries 1981-2021

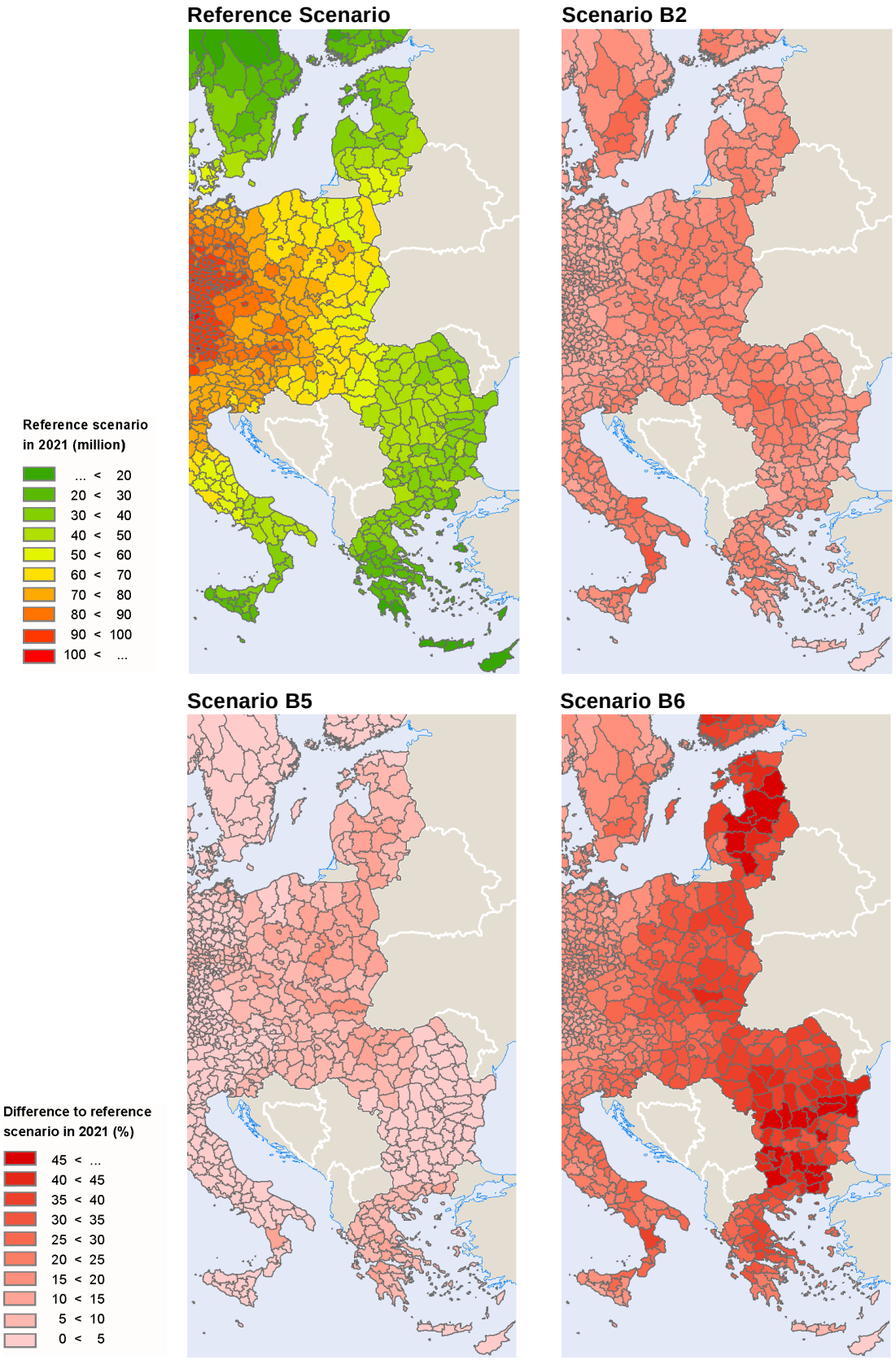


Figure 5-13. Accessibility rail/road/air, travel in the Reference Scenario and accessibility effects of Scenarios B2, B5 and B6

The two heavy black lines in Figure 5-12 represent the development of accessibility in the Reference Scenario in EU15 and AC12 between 1981 and 2021, the thinner blue lines show how the three infrastructure scenarios deviate from the Reference Scenario after 2001

All three scenarios improve accessibility everywhere, with the greatest improvements in the accession countries. This is due to the greater emphasis on infrastructure projects in eastern Europe in the recent TEN and TINA planning documents.

Projects in the accession countries themselves (Scenario B5) contribute little to this improvement; more important are the corridors linking the accession countries to western Europe. However, if the number of projects in the accession countries is increased (Scenario B6), the effect is larger. The gap in accessibility between western and eastern Europe remains in all scenarios except in Scenario B6.

GDP per capita

Table 5-3 shows the results for GDP per capita of the three scenarios as differences between the policy scenario and the Reference Scenario in 2021 in percent for the old EU member states (EU15), Switzerland and Norway (CH+NO), the twelve accession countries (AC12) and the ESPON Space (EU27+2). In addition to the unstandardised values, the results are also standardised as percent of average GDP per capita in the ESPON Space to show the relative losers among the regions. The unstandardised values include generative effects, whereas the standardised values shows distributional effects that would occur if there were no generative effects (zero-sum game). Figure 5-13 shows the spatial distribution of GDP per capita in the Reference Scenario and the impacts of the three infrastructure scenarios.

Table 5-3: SASI model: GDP per capita

Scenario	GDP per capita difference between policy scenario and Reference Scenario (%)			
	EU15	CH+NO	AC12	EU27+2
Unstandardised				
B2 All TEN/TINA projects	+2.62	+2.39	+3.06	+2.62
B5 TEN/TINA only in cohesion countries	+0.44	+0.21	+1.19	+0.46
B6 TEN/TINA + maximum TINA projects	+3.11	+2.69	+5.49	+3.20
Standardised (EU27+2=100)				
B2 All TEN/TINA projects	–0.01	–0.23	+0.43	0.00
B5 TEN/TINA only in cohesion countries	–0.02	–0.25	+0.73	0.00
B6 TEN/TINA + maximum TINA projects	–0.08	–0.49	+2.22	0.00

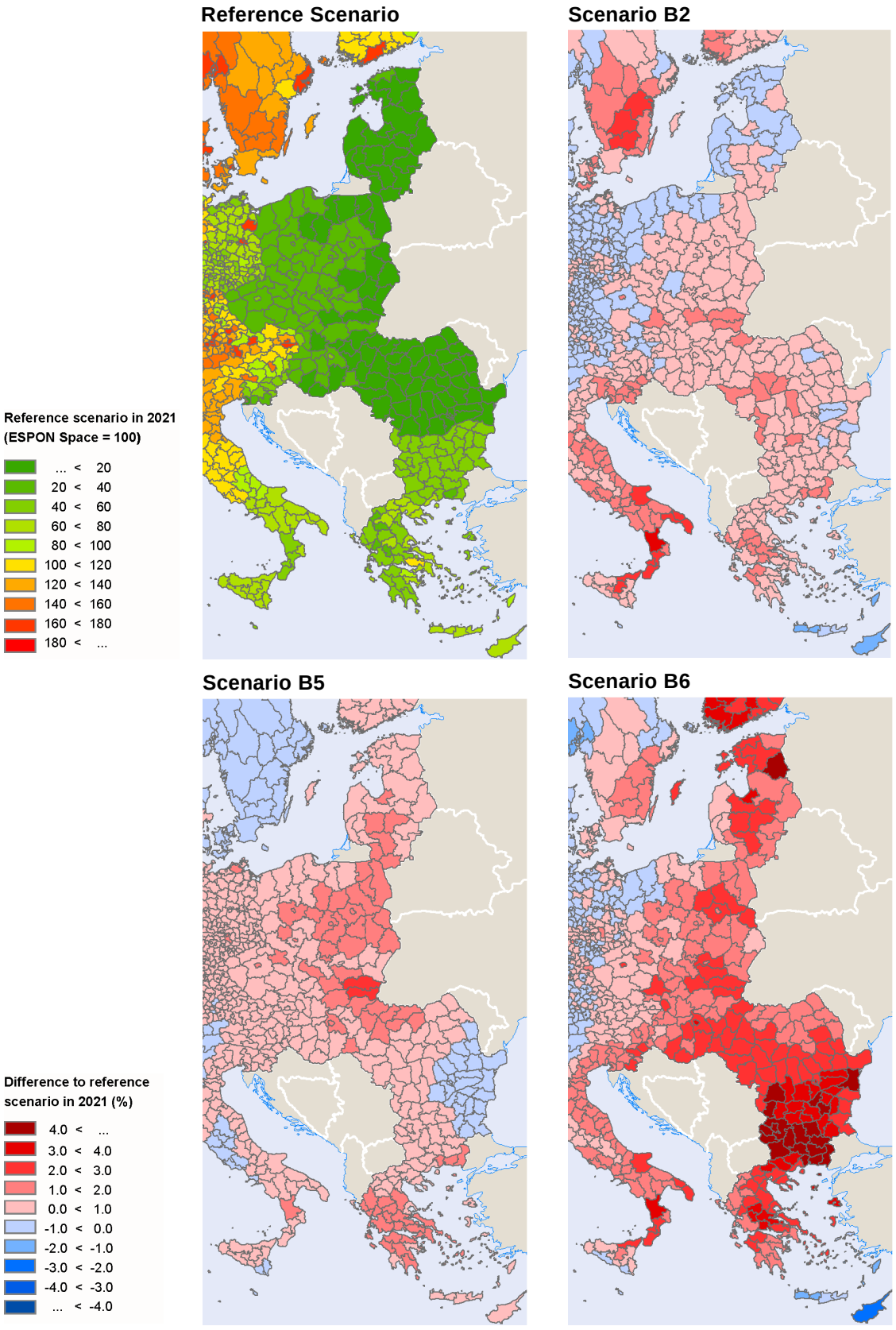


Figure 5-14: GDP per capita in the Reference Scenario and GDP per capita effects of Scenarios B2, B5 and B6

The first thing to note in Table 5-2 is that relative large changes in accessibility translate into only very small changes in economic activity. If only distributional effects are considered, the changes are even smaller. But again the accession countries are the absolute and relative winners. In absolute terms, Scenario B5 is the least profitable for the accession countries, but in relative terms Scenario B5 performs better than the full TEN/TINA scenario B2. In both absolute and relative terms, as expected, Scenario B6 with maximum additional infrastructure projects in the accession countries produces the largest gain for the accession countries.

For the maps in Figure 5-14 also the standardised values of GDP per capita (EU27+2=100) were used. The map of the Reference Scenario shows the gap in wealth between the old member states and the accession countries. The other three maps show the impacts of the three scenarios: which regions gain (in red) and which lose (in blue) compared to the Reference Scenario. As already Table 5-2 indicated, the accession countries gain more if more infrastructure projects on their territory are implemented. However, none of the scenarios closes the gap in economic performance between the old and new member states. This underlines that transport infrastructure alone is not enough to significantly reduce the existing economic disparities between western and eastern Europe. However, massive provision of transport infrastructure as in Scenario B6 would contribute to that goal.

Cohesion

The SASI model calculates a range of cohesion indicators to measure the convergence or divergence of economic conditions under different scenarios. Two dimensions are relevant if cohesion indicators are to be compared:

- The first dimension is the area considered. Cohesion at the European level means a reduction of economic disparities between the rich regions in the European core and the poorer regions at the European periphery or, after the enlargement of the EU, between the western and eastern member states. Cohesion at the level of level of meso-regions or individual countries looks at the economic disparities within these areas. Unfortunately, both types of cohesion may be in conflict.

The second dimension is the cohesion indicator used. It has been demonstrated in ESPON 2.1.1 that different cohesion indicators give different results (Bröcker et al., 2003). Some commonly used indicators even indicate convergence where in fact divergence has occurred. One important distinction is whether the indicator measures relative or absolute convergence or divergence – if, for instance, all regions gain in relative terms by the same percentage, the richer regions gain more in absolute terms.

Table 5-4 and Table 5-5 show the cohesion effects of the three infrastructure scenarios with respect to the distribution of accessibility and GDP per capita, respectively, compared to the Reference Scenario. For easier reading the information is simplified: a plus-sign indicates a pro-cohesion effect (i.e. disparities become smaller) and a minus-sign indicates an anti-cohesion effect (disparities grow larger). Five different cohesion indicators were calculated for the ESPON Space (EU27+2) and the accession countries (AC12). The five indicators are indicators commonly used in the literature; the first four measure relative convergence or divergence, the last one measures absolute convergence or divergence.

Table 5-4: SASI model: accessibility cohesion effects

Scenario	Accessibility cohesion effects (+/–)				
	CoV	Gini	G/A	RC	AC
ESPON Space (EU27+2)					
B2 All TEN/TINA projects	++	++	++	++	–
B5 TEN/TINA only in cohesion countries	+	+	+	+	–
B6 TEN/TINA + maximum TINA projects	++	++	++	++	–
Accession countries (AC12)					
B2 All TEN/TINA projects	+	+	·	+	—
B5 TEN/TINA only in cohesion countries	–	–	–	–	—
B6 TEN/TINA + maximum TINA projects	++	++	++	++	—

+/++ Weak/strong cohesion effect: disparities reduced
–/— Weak/strong anti-cohesion effect: disparities increased
· Little or no cohesion effect

CoV Coefficient of variation (%)
Gini Gini coefficient (%)
G/A Geometric/arithmetic mean
RC Correlation relative change v. level
AC Correlation absolute change v. level

Table 5-5: SASI model: GDP/capita cohesion effects

Scenario	GDP/capita cohesion effects (+/–)				
	CoV	Gini	G/A	RC	AC
ESPON Space (EU27+2)					
B2 All TEN/TINA projects	+	+	·	+	—
B5 TEN/TINA only in cohesion countries	+	+	+	+	–
B6 TEN/TINA + maximum TINA projects	+	+	+	+	—
Accession countries (AC12)					
B2 All TEN/TINA projects	–	–	·	+	—
B5 TEN/TINA only in cohesion countries	+	+	·	++	–
B6 TEN/TINA + maximum TINA projects	–	–	–	—	—

+/++ Weak/strong cohesion effect: disparities reduced
–/— Weak/strong anti-cohesion effect: disparities increased
· Little or no cohesion effect

CoV Coefficient of variation (%)
Gini Gini coefficient (%)
G/A Geometric/arithmetic mean
RC Correlation relative change v. level
AC Correlation absolute change v. level

A methodological difficulty in forecasting polycentricity is that polycentricity is studied with cities as geographical units, whereas the SASI model is based on NUTS-3 regions. Therefore the following assumptions were made to bridge the gap between NUTS-3 regions and cities:

- *Size Index*. The population and GDP of a city change as the population and GDP of the NUTS-3 region in which it is located.

- *Location Index*. The number of cities and hence the number and size of service areas remain constant.

- *Connectivity Index*. The accessibility of a city changes as the accessibility of the NUTS-3 region in which it is located.

Figure 5-15 shows the development of the Polycentricity Index of national urban systems (see Section 2.2) between 1981 and 2021 calculated on the basis of functional urban areas (FUAs) with the SASI model using the above assumptions.

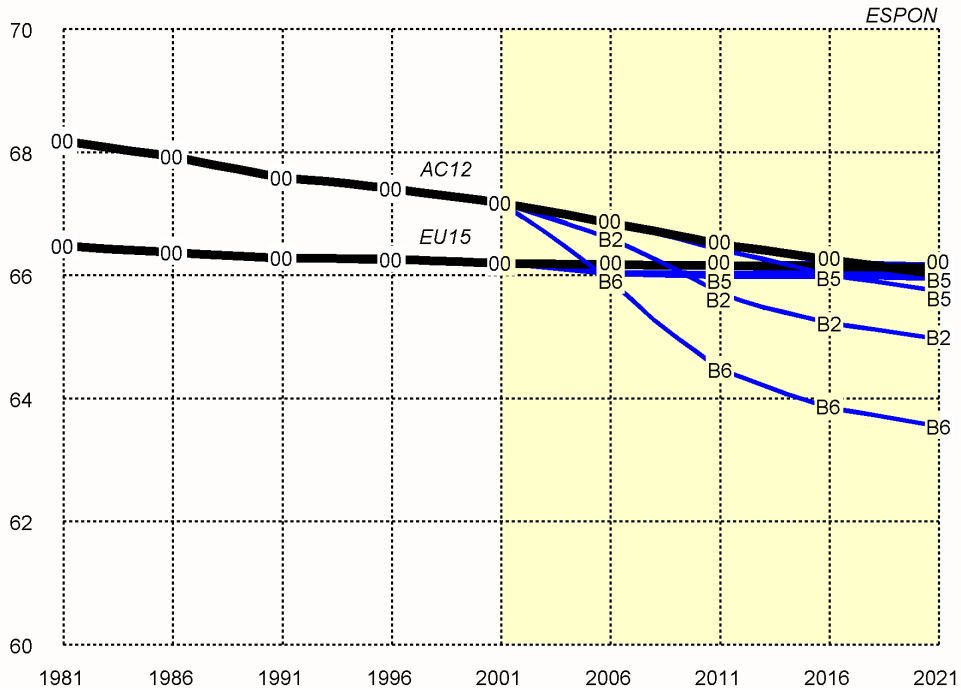


Figure 5-15: Development of polycentricity in the old EU member states and the accession countries 1981-2021

The two heavy black lines in Figure 5-15 represent the development of the Polycentricity Index of national urban systems between 1981 and 2021 averaged over the countries of EU15 and AC12, the thinner blue lines indicate how the three infrastructure scenarios deviate from the Reference Scenario after 2001.

The diagram confirms that the urban systems of the accession countries are at present on average more polycentric than those of the old member states (see Section 2.2). According to the backcast, they were even more polycentric in the past, probably because of their history as planned economies in which there was no market-driven spatial development.

However, if the forecasts of the model are correct, polycentricity in the accession countries will decline due to market forces and in the medium-term be even lower than that of the old member states. Polycentricity in the old member states declines, too, but much slower than in the accession states because of their longer experience with market-driven spatial development, and in the long run even comes to a halt.

This is possibly also the reason why the infrastructure improvements in the three scenarios have only little effect on polycentricity in the old member states. Another reason may be that the transport networks in the old member states are already highly developed and can only marginally be improved. However, in the accession countries there is still a great demand for transport infrastructure and so infrastructure improvements have much larger effects. As it has already been observed in the discussion of cohesion, infrastructure improvements tend to be oriented towards the largest cities with the effect that polycentricity goes down in proportion to the volume of infrastructure improvements in the scenarios.

5.3 Towards policy conclusions

According to the time schedule of ESPON 1.1.3, the main work on the two scenario studies will be conducted in the final year of ESPON 1.1.3. Therefore here only preliminary remarks on the expected results of the two studies can be made.

Scenario Study 1

We tested four scenarios including the extrapolation of the calibrated (1996 situation with a view to examining the long term steady state in terms of the attraction of population and employment to each of the 29 countries. We summarise our findings as follows:

- the largest accessibilities are in the areal core of the New Europe and our model picks this up, shifting population and employment towards this heartland in the absence of inertial factors which mitigate this redistribution. This is the essence of the trend projections
- There are considerably less spill-overs from new activity in different countries into other countries than we expected.
- There is a tendency for the west to capture more activity than the east even when the east is favoured in terms of investment/subsidies in employment
- There is a general spreading of activity throughout the new Europe which is tantamount to a redistribution from large to small countries and from peripheral to core, with the exception of Scandinavia and the Baltic States that appear somewhat of an exception, capturing activity from Poland and Germany.
- The migration south scenario benefits the west rather than the east but the two non-EU countries Switzerland and Norway, appear to benefit most from any of the scenarios tested. This is probably due to their inclusion in the model rather than any innate advantages which are built into the model.

Scenario Study 2

As the transport infrastructure scenarios specifically designed for ESPON 1.1.3 will be developed only in the final year of the project, here only some preliminary findings of the backcasts and forecasts undertaken in ESPON 2.1.1 are summarised:

- Transport infrastructure improvements in the accession countries and between the accession countries and the old EU member states contribute to bridging the economic gap between the old and new member states.

- Transport infrastructure improvement alone are not sufficient for significantly reducing the economic disparities between the old and new member states; they have to be integrated with other policies.

- Transport infrastructure projects that improve the transport corridors between the old and new member states are more important than transport infrastructure projects within the accession countries.

- Transport infrastructure improvements designed to reduce spatial disparities at the European level are likely to increase spatial disparities within the accession countries at large or within individual countries..

- In the past two decades polycentricity has declined in all European countries due to the faster growth in accessibility, economic activity and population of the larger metropolitan areas. The decline in polycentricity is likely to continue in the future.

- The urban systems in the accession countries are on average still more polycentric than those of the old EU member states. However, the decline in polycentricity in the accession countries is faster than that in the old member states and is likely to continue in the future.

- Except the transport pricing scenarios, all transport policy scenarios examined in ESPON are likely to accelerate the decline in polycentricity in the accession countries.

These tentative results will be substantiated during the final year of ESPON 1.1.3.

Further work

Work in the final year of ESPON 1.1.3 for the two scenario studies will concentrate on model development and calibration, the definition of scenarios and the simulation and interpretation of the results.

Particular emphasis will be placed on the comparability of the results of the two models. This will be achieved by early co-ordination of the spatial and temporal resolution and scope of the two models, the specification of comparable output indicators and the definition of common background scenarios for the policy scenarios to be examined.

The work will conclude with policy conclusions and recommendations based on the results of the two models.

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Chapter 6. Making Policy Recommendations for Enlargement: Policy Combinations

Lars Olof Persson and Lisa Van Well

When the European Union increased in population by 28 percent and expanded its territory by 34 percent on 1 May 2004, new challenges and possibilities of the enlarged Union have advanced to the forefront of European spatial development, particularly with regard to cohesion policy and sustainable economic, social and ecological development. The challenges and possibilities that enlargement poses have not taken the Union by surprise, as indeed efforts have been forthrightly underway since the process to develop the European Spatial Development Perspective (ESDP) began in 1993. ESPON 2006 is one of the current efforts to address the spatial tissue of the Europe in its near entirety (EU27+2) with its mandate to indicate, map and diagnose spatial development of the European territory. Also explicit in the ESPON mandate is to develop policy recommendations grounded in rigorous quantitative and qualitative data and research.

Yet making policy recommendations for such a vast and diverse territory and culturally, socially and historically heterogeneous population is no easy task. This task is further complicated by the fact that the European Union does not enjoy competency in the area of Spatial Development Planning (although it does wield a great power through the Structural and Cohesion Funds). Thus any serious attempt to make policy recommendations must first take up the question of *to whom* the recommendations are addressed. The ESPON programme encourages a *multi-level approach* to policy recommendations with efforts directed at the EU level, the nation state level and the regional/local level, as well as a *cross-sectoral approach* to ensure that the norms sustainable and cohesive spatial development are reflected in all policy areas of the EU and member states.

In this paper we present the policy "Combination" approach being developed by ESPON project 1.1.3 and put the "art and science" of making policy recommendations into a broader context of multi-level governance. First we examine the driving forces and dilemmas of the EU10 Accession countries, as enumerated by Inotai. We then erect a preliminary framework for making policy combinations for the spatial developed of the enlarged Union based on the concepts of governance, norms and the logics of consequences and appropriateness. The case of spatial consequences for an enlarged EU is subsequently presented, along with a delineation of two "rationales" in which to make recommendations. Finally we summarize the analysis and give some practical suggestions for the process of making policy combinations.

6.1 Ten Accession Countries – Common Features and Challenges to European Spatial Policy

In order to better understand the driving forces and dilemmas connected to their accession to the EU, Inotai (2003)[1] summarizes seven common characteristics of EU10, largely rooted in history. Together these cover a wide range of challenges to European policy in general and spatial policy in particular.

A. A Buffer Zone over centuries

During the last 1000 years these ten countries have always been parts of a buffer between West and East. This feature will remain also after accession. The new challenge is to redefine the future borders of Europe in terms of security. This has to take into account the interests of the new neighbours, but not at the expense of the new Member states relying on new security systems in Europe and the North Atlantic.

B. Economic Periphery and Peripheralization

The highly differing income levels reflecting differences in economic and industrial activity between neighbouring countries in Eastern Europe puts an intensive pressure to reinforce and speed up the catching up process.

C. Cultural and Ethnic Diversity

The regions of East Central, and South Eastern Europe as well as Eastern Baltic Sea region are multicultural regions, with corresponding problems and potential advantages. The cultural diversity has a spatial pattern. These parts of Europe have to overcome its historical burdens only if the advantages of multicultural cooperation prevail against perceived complaints of the past.

D. Top-down versus Bottom-Up Development Patterns

Most countries in the region are the historical products of top-down development. The results were both positive and negative: individual survival techniques, high levels of flexibility, and innovative behaviour at the one hand, and a subsidy mentality, corruption, tax evasion and overriding of centrally set rules on the other. The transformation into a decentralized and responsible development pattern, which started in the end of 1980s, is still an important challenge, in particular in designing and implementing regional policy.

E. Failure at the Threshold

Throughout their history many of the countries within EU10 have been ready to pass the threshold to reach the development path in the Western countries, but have never quite reached the mark. The reasons have been sometimes a war coming up, sometimes political or institutional failures. In the current process it is obvious that

[1] Inotai, A., 'The Eastern Enlargement of the EU', in Cremona, M., 2003 The Enlargement of the European Union. Oxford University Press

there must be realistic expectations on how fast modernization can take place, and that institutions facilitating integration have to be installed.

F. Modernization Anchor Outside the Region

There is little doubt that the modernization anchor until now remains located outside its geographic frontiers and explains why regional cooperation has been limited in the past. However, as these countries now accede the EU, the prospects for regional cooperation should improve spectacularly, in trade, investments and joint infrastructural and environmental projects.

G. Economic Modernization versus National Sovereignty

Today we can see that in many countries in EU10 there is a certain split in the society. On the one hand, they accept that their key to economic modernization is the EU. On the other hand they would like to keep their political sovereignty. The challenge is that shared sovereignty, interdependence, practical strategic alliances, flexibility are the most important requirements in order to protect national interests in the new enlarged EU.

6.2 Governance and the European Spatial Development

It has become increasingly popular to utilize the term "governance" in local politics (Cars et al 2002), national politics (Keohane 2001, Young 1999) and even European Union politics (White Paper on European Governance, Jachtenfuchs and Kohler-Koch 2003). Governance definitions vary, but most are quite general and usually posited against more traditional conceptualizations of "government" (Cf ESPON 1.1.1 SIR). Others define governance via the actors involved in the process, with the "government" connotation including the actions of the public sector and formal political and executive functions. "Governance" subsequently expands and diversifies the scope of operative agents to include civil society organisations, business interests and public participation. Other definitions conceptualise governance as a goal-oriented process (involving diverse actors). Jachtenfuchs and Kohler-Koch (2003:4) see governance as "… the continuous political process of setting explicit goals for society and intervening into it in order to achieve these goals". For the purposes of making policy recommendations for European spatial development policy, the idea of governance is a useful point of departure since it implies that recommendations should not only be directed to national, regional and local governments and the European Commission, but also to the plethora of other actors involved developing, implementing and monitoring the goals and norms of the European spatial development. The Third Report of Economic and Social Cohesion (18 Feb. 2004) reiterates the need for a wider governance perspective to social and economic policy. "There is a growing consensus about the importance for regional competitiveness of good governance – in the sense of efficient institutions, productive relationships

between various actors involved in the development process, and positive attitudes towards business and enterprise" (2004: xi)

Parallels for the European governance perspective are often found in the European integration perspectives of the 1990s where "(i)nstead of thinking in terms of the Community's capacity to impose decisions forcibly on the member governments, integration has to be considered as some sort of symbiosis between the Community and national systems. As a result, actors tend more and more to define their roles in terms of joint problem-solving rather than as agents of one system or another" (Soetendorp in Carlsnaes 1994:108). Governance only augments the range of actors involved and focuses on process rather than static institutions.

6.3 Spatial Development as a Normative Process

Spatial development is still the formal and legal domain of national and local governments. While the EU does not have full competence in the area spatial development, it has been active in producing a set of common norms for the area. *Norms* describe "collective expectations for the proper behavior of actors with a given identity" (Katzenstein 1996:5). They differ from policies or regulations in that they have weak legally enforceable qualities. Rather norms prescribe or proscribe the range of acceptable actions for an actor (governmental or non-governmental) that adheres to a certain identity. Some norms are the result of a lengthy consensual negotiating process while others appear to occur spontaneously or seem common sense.

With regard to European spatial development, we can conceive of the primary normative document being the ESDP[2]. This legally non-binding code of guidelines and actions that "ought" to be carried out has no legal backing, but assumes its power via the intensive negotiating process between governments and EU institutions that preceded the adoption of the document. The broad norms of the ESDP are synthesized into *economic and social cohesion*, *conservation of natural and cultural heritage* and *balanced and effective competition across the community territory* and further operationalised as *polycentric spatial development*, *prudent management of natural and cultural heritage* and *equal accessibility to transport, communication infrastructures and knowledge* respectively.

The value added of conceiving of European spatial development as a primarily normative process is that it can aid us in determining *which* and *to whom* policy recommendations can be addressed. Also since normative research is embedded in the discipline of international relations, and in particular in the research of international

[2] The ESDP process has also be conceptualised as a "discourse" by Böhme (2003) or "ideology" by Hajer (1989). These conceptualisations obviously are close to seeing the ESDP process as a normative one. The focus on norms, however, in our definition, put more emphasis on the identity factor, that is that the ESDP proscribes and prescribes the actions that should be taken for an actor with a "European" identity.

institutions, insights can be drawn from this area that are also appropriate of the spatial planning field.

6.4 The logics of consequences and appropriateness

In an article in the special issue of International Organization, March and Olsen recap their institutional perspective as a way of thinking about the possible futures of international (or supra-national in the case of the EU) institutions. Institutions, like norms, are defined by March and Olsen (1998:948) as "a relatively stable collection of practices and rules defining appropriate behavior for specific groups of actors in specific situations. Such practices and rules are embedded in structures of meaning and schemes of interpretations that explain and legitimize particular identities and the practices and rules associated with them". The bases of action by which human behavior is interpreted are logics of consequences and appropriateness (March and Olsen 1998:949). March and Olsen ask the descriptive and problem-driven question of *when* one or the other of the logics is more likely to be observed as the basis for actual behaviour. If we can have some idea of what drives governance behaviour we can perhaps more accurately determine to whom and which policy recommendations will be appropriate.

The logic of expected consequences "sees political order as arising from negotiation among rational actors pursuing personal preferences or interests in circumstances in which there may be gains to coordinate action" (March and Olsen 1998:949). Obligations for individuals in this logic are given through consent and contracts of consequential advantage. Decisions radiating from this logic will be rationalistic and preference will be largely taken as given. Recommendations for policy actions will tend to be sectoral in nature, as the logic sees the complex political process as largely decomposable into relatively autonomous subsystems that if linked, are linked hierarchically.

The logic of appropriateness, on the other hand, is rule-based. "Human actors are imagined to follow rules that associate particular identities to particular situations… (a)ction involves evoking an identity or role and matching the obligations of that identity or role to a specific situation" (March and Olsen 1998:951). Choice within this logic is less focused on sectoral and stable interests and more focused on larger norms and identities. Those actions that validate an actor's chosen or assumed identity will be seen as the most appropriate. This logic also allows for decisions integrated among sectors and linkages among policy levels. In terms of making policy recommendations, this logic can appeal to a variety of actors involved and take up larger cross-cutting issues. For example, the norms constituting the goals of the ESDP regarding spatial development will thus guide both identities and action of actors and so policy recommendations for these norms are of essentially different character than those within the logic of consequences.

March and Olsen (1997:952) contend that the two logics are not mutually exclusive and most political and social actions will involve elements of each logic. It makes sense that in making policy recommendations it is helpful to first distinguish that both of the logics will be operating in patterning decisions and to then make recommendations accordingly. In the following sections we describe the case of potential spatial consequences for EU Enlargement and suggest two "rationales" of integrated or combined policy recommendations - one dealing with EU sectoral policy and based on "implementing" the principles of the ESDP via the logic of consequences and the other taking up integrated aspects of institutional capacity of national governments and regions from a bottom-up perspective, identity-driven process based on the logic of appropriateness. In the first case the policy recommendations are addressed to EU institutions for sectoral policies or financed by Structural and Cohesion funds, as well as the Interreg funds. We call these **Principle-based policy combinations**. In the second case policy combinations are addressed primarily to national, regional or local governments, businesses and civil society organisations and focus on the capacity to implement EU funding opportunities integrate wide reaching EU policies into development policy, thus called **Capacity-based policy combinations**.

6.5 The Case of Potential Spatial Consequences of EU Enlargement

In the *Terms of reference* for all ESPON projects, the Monitoring Committee on behalf of the EU Commission emphasizes one of the main objectives for the research:

- "to develop possible guidelines for policy responses taking the diversity of the wider EU territory in account and considering institutional, instrumental and procedural aspects" (ww.espon.lu)

Hence, in order to take the *diversity of the territory* into account each of the ESPON projects has the task of describing, analyzing and diagnosing the spatial structure of its particular research object, whether it is the demography, the transport infrastructure, the agricultural sector, the natural heritage or the spatial consequences of enlargement of the EU, or whatever. No doubt, this task is extremely demanding, particularly since the diversity of the EU territory increases dramatically as new Member States with very different characteristics are entering. Policy recommendations have to be based upon maps and typologies showing the extension of particular weaknesses and strengths as well as opportunities and risks. For a common acceptance of these maps and typologies, they have to be based on harmonized and quality proofed data covering the entire territory.

In order to consider the *institutional and procedural aspects* it is necessary to relate to the general principles of EU policy implementation, such as the subsidirity principle and involvement of active regional or local partnerships. Also this task is quite a challenge in the current process of enlargement, including the accession of countries with very different institutional structure and often – for historical reasons - still underdeveloped operational capacity at regional and local level. Hence, policy recommendations in this field have to suggest explicit procedures for capacity building at both national and regional and local levels in differing institutional and cultural contexts.

In this chapter we suggest a "methodology" for making policy "combinations" for a polycentric, sustainable, cohesive and competitive development in EU enlargement in both the near and long term future. We suggest the term policy combinations as this perhaps better describes the process of coordinating coherent policy interventions that are both multi-level, spanning the vertical levels of government and administration, and inter-sectoral, with the integration of range of traditional policy areas that better capture the territorial dimension of polycentric development. There has long been a great demand for more coherence in policy objectives and interventions.

The White Paper on European Governance (COM (2001) 428 Final) expresses that "(T)he territorial impact of Eu policies in areas such as transport, energy or environment should be addressed. These policies should form part of a coherent whole…; there is a need to avoid a logic that is too sector-specific. In the same way, decisions taken at regional and local levels should be coherent with a broader set of principles that would underpin more sustainable and balanced territorial development within the Union".

As indicated in Chapter 2, polycentric spatial development and policies to encourage such development may not always go hand in hand with the normative objectives of competitiveness at global and European scales, cohesion at national scale and conservation or sustainability concerns. The conflict of goals enumerated in Chapter 2 thus succinctly points out the need for careful combinations of policy interventions in order to promote synergy effects.

6.6 Setting the scene: Expected spatial shifts before and after enlargement

On May 1 2004, the borders to ten new Member States opened for a free flow of goods, labour, services and capital. There is little doubt 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 sectors 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 probably be affected by an increased import. This will 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 located in old industrial regions and rural regions, especially those which are close to the new external border.

This general reorientation of economic flows from East to West in Europe has already taken place during the 1990s. 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 new member states. 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 located in corridors that mainly constitute axial extensions of the "Pentagon" in EU15.

Different feedback processes, including national policy responses, will dominate the regional development in balanced or unbalanced directions: If unfettered centrifugal forces 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 centripetal forces instead dominate, a polycentric and convergent development will be the consequence, i e line with the normative objectives from ESDP mentioned in the first chapter. 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.

6.7 Risks to cope with and potentials to be developed

In summary, we identify the following categories of risks and potentials in the enlargement area of the European Union:

- Structural change of the industrial sector, involving decreasing demand for labour in deindustrializing regions and establishment of new industries in other regions
- Relocation of industrial capacity to regions with relative low costs of labour
- Outmigration from regions with high unemployment and low GDP per capita to regions with expansive economies
- Concentration of economic activities to monocentric regions, especially capitals, and to regions along the major trade and transport links
- Improving economic performance in regions with polycentric location and in spatially associated or clusters of regions
- Slow integration process in terms of flows of goods and people across borders with low permeability and with asymmetric relationships
- National policy responses counteracting negative, and reinforcing positive, consequences of the enlargement

6.8 Need for designing and prioritizing policy measures at EU level

In consequence, there is a need for designing and prioritizing integrated policy measures to cope with these risks and for developing the potential in all parts of Europe in the ongoing enlargement process.

Structural and Social Fund Policy measures for competitiveness and cohesion suggested in the Third Cohesion Report are primarily aiming at:

- Promotion of Innovations and the Knowledge economy
- Improved Accessibility
- Sustainable natural environment
- Administrative capacity
- Education, employment and social support systems

There is a demand for agreeable basis for policy recommendations along all these five items at EU level. It is a general experience that agreements among all Member States at EU level have to be based on a quantitative and comparable set of indicators covering all Member states. In this case, risks and potentials signaling specific needs are identified and mapped in all segments of the new EU25 territory and at a lowest possible geographical level. Hence, we have suggested in this report relevant typologies of regions based on available and harmonized data at NUTS3 level across EU25.

In our conceptualisation of making policy combinations we suggest a *principle-based rationale* for making policy combinations: Elementary and European-wide typology of regions at risk and with potential based on minimum data. We expect that these threats could be eased and that these strengths could be liberated by promotion of innovation systems and the knowledge economy and by improved accessibility, as suggested the Cohesion report.

However, in order to suggest efficient measures to improve administrative capacity to handle the spatial policy, we also suggest a *capacity-based rationale* for policy combinations to encourage activating bottom-up processes. Capacity-based recommendations or combinations deal with the integrated concepts of administrative or institutional capacity and cross-sectoral integration for achieving sustainable economic, social and ecological development.

6.9 Principle-based Policy combinations: Elementary and European-wide typologies of regions at risk and with potential based on minimum data.

We have developed preliminary *European-wide typologies* based on sets of quantitative indicators. The selection is based on *implicit hypotheses* on what constitutes the region's strengths and weakness in the new economic integration process. The theoretical foundations for these hypotheses are linked to fields of regional economy as economy of scale, agglomeration theory, path dependency and network theory. Empirical evidence of spatial implications registered after the previous enlargement involving new member states with considerable handicaps in terms of economic performance and income standards, i e the accession of Greece, Portugal and Spain in the 1980s, form another basis for selecting criteria for the typologies. Underpinnings are also made to the logic of consequences where preferences and interests are coordinated via the process of negotiation among rationally self-interested member states to procure coordinated and integrated spatial development policy action at the EU level. As displayed in Chapter 3, the following indicators are, or will be, employed:

- *Population*, reflecting the current size or mass of the respective administrative NUTS 3 region as such, and the regional labour supplies in relation to total regional population
- *Demographic Trends* described by the types of demographic change observed by ESPON 1.1.4.
- *Performance*, indicating the level of wealth as well as cost of labour in the region,

- *Function,* describing the region´s proximity – in travel time - to FURs described by ESPON 1.1.1. (to be included in the Final Report)
- *Converging or Diverging Economic Trends*, the historical trajectories of industrial development in the 1990s
- *Industial Specialization,* reflecting the dependance on Primary, Secondary and Tertary sectors
- *Potential Accessibility,* reflecting both the region's emerging multimodal accessibility in ESPON space and in the national context
- *Border characteristics, reflecting* the borders' importance as barriers in economic, infrastructural and cultural terms.
- *Neighbourhood or spatial association* illuminates the spillover or contiguous effects of economic growth or deprivation between adjacent regions or clusters of regions

These elementary typologies aim at a preliminary assessment of where and to which extent there appear risks for a monocentric development or potential for polycentric development at different levels. The typology should also give indications of the differential needs for coordinated policy intervention at EU, national and regional level.

In the second step – to be pursued in the final year of our project - we introduce qualitative information, describing *unique* features for regions within each typology.. We will largely compile information produced in other ESPON projects, in particular 1.1.1, 1.1.2, 1.1.4, 2.1.1, & 1.3.2 and 1.3.3 and search for complementary information on

- Cultural aspects, e g language barriers and commonalities
- Location of specialized functions
- Indicators of administrative capacity
- Existing or Planned Cooperation strategies between region
- Natural heritage
- Industrial structure and change

This leads to final assessment of where there appears potential for polycentric and sustainable development at different levels. The final assessment should also give specified indications of the spatial distribution of differential needs for coordinated or combined policy intervention at EU, national and regional level.

6.10 Capacity-based Policy Combinations: Activating Bottom-Up Processes

Policy combinations emerging under the guise of the logic of appropriateness will tend to focus on institutional learning and various types of partnerships to achieve the normative goals of the ESDP. They are complementary to those types of policy recommendations depicted in principle-based policy combinations for the logic of consequences.

Capacity-based policy combinations are thus addressed to a wider scope of governance actors as well as the cooperation, partnerships and networks developed among them for strategic problem solving. As Kohler-Koch states "The EU is… a system of "network governance" which thrives on co-ordinating a multitude of actors and approximating diverse interests" (Kohler-Koch 2002: 4). These recommendations should also address the problem coordinating policy intervention vertically across sectors and horizontally in a multi-level system of governance.

The logic of appropriateness focuses on the process of building of a common identity, in our case a common European identity, but the obvious rejoinder to assumption is that this identity is not consistently called upon. National identities are still strong and the primary motivators of economic and social policy. Many of the accession countries have been experienced drastic and frequent swings in the change of rule over the last millennium and thus identities and symbols of the nation state are more important than ever. However the drive to be included in the Union of Europe, even if initially to derive economic and developmental benefits, must be presumed to "spill-over" into at least some internalization of a greater European identity. States and regional actors then ask the questions of how a member of the EU would act in a certain circumstance. Policy recommendations or combinations should be directed towards those actions that facilitate convergence into the set of norms enumerated up by the ESDP.

These types of combinations are aimed at activating bottom-up processes.

In order to make policy combinations that stimulate bottom-up governance processes and reflect the logic on appropriateness two approaches are suggested:

- Stimulate Institutional Capacity Building at regional level
- Stimulate National and Regional Coordination of Policy sectors

These approaches are necessarily grounded in identifying and classifying current administrative capacity at national and regional levels in each country in EU10 and thus must be based on tight empirical data and useful typologies. ESPON project 1.1.3 is beginning its efforts in this area. Indicators of administrative capacity and bottom-up approaches include the regulative framework for an institution or administration, the existence of strategies and plans for implementing spatial development policies, Local Agenda 21 plans, environmental impact assessments and sustainability indicators share of expenditure allocated for the various sectors involved in spatial development, outside funding, networking and cross-border cooperation efforts. It is

useful even prior to the collection and analysis of data to consider the bottom-up approaches in more general terms.

6.11 Stimulating Institutional Capacity at regional levels

Even with a process-oriented approach to governance, institutions remain important, but rather than being seen as static variables, the governance approach seeks to understand how institutions can be transformed to increase capacity and boost efficiency for making and implementing decisions. In the case of spatial development, institutions must be able to internalize and act upon the norms developed within the ESDP in light of their identifies as "European" actors. Policy recommendations for stimulating capacity regional levels in the accession countries could include:

- Evaluating institutional frameworks
- Boosting human resources
- Creating more efficient communication mechanisms and facilitating networking

Institutional frameworks include the set up of the national, regional or local governmental and administrative apparatus utilized to take, make, implement and monitor policy decisions. These will vary considerably with regard to the efficiency in implementing the Community acquis and in allowing room for maneuver for including various forms of public-private partnerships, public participation or multi-level policy coordination. In some accession countries (such as Latvia) the regional and county administrative districts are in the process of being redrawn or amended away from the former Soviet models to better reflect "Europeanisation". This in itself produces both new possibilities, but also organizational entropy if the process is not yet complete or still ongoing.

Building capacity for *human resources* includes expanding the range of knowledge and the frames of reference to interpret knowledge regarding EU spatial development norms and policies. It also deals with increasing the hands-on interest and learning capacity of stakeholders such as citizen groups or associations for getting involved in bottom-up governance processes. In many of the former Soviet states, there is lacking a recent tradition of citizen involvement, thus introducing the challenge of mobilising a broader sphere of actors.

For creating more *efficient communication mechanisms and facilitating networking* demands that stakeholders see and react on the possibilities to achieve common actions and engage in joint problem solving. To do this there must be open communication channels to policy makers, businesses and the public and governance routines should be made more transparent. Networking within and without the EU in terms of INTERREG III funding and the new Neigbourhood Instrument should be

encouraged to a greater degree and the emphasis should be more on the non-hierarchical exchange of ideas and knowledge, rather than based on forms of clientelism between actors of differing status and power.

6.12 Stimulating national and regional capacity for coordination of policy sectors

Coordinating policy sectors to achieve the norms of the ESDP; economic and social cohesion, conservation of natural and cultural heritage and balanced and effective competition across the community territory is not a straightforward task- at the European level or at the local level. Yet with the goal to produce synergies among these norms it is necessary to create novel means of at least coordinating, if not integrating, diverse policy sectors such transport, the internal market, competition, agriculture, environment, culture, etc. This is particularly reflected in the call for sustainable economic, social and ecological development, yet the tools to integrate these areas are still few and far between. In the quest for economic growth and the levelling of economic and social disparities in the EU25, environmental concerns are usually rhetorically highlighted, but pushed to the back seat when in conflict with actual economic or social issues.

The Treaty of Union emphasizes that "Environmental protection requirements must be integrated into the definition and implementation of other Community policies" (Article 130R(2). This is a new challenge for many of the new member states. "In terms of the environment, the largest burden in the EU accession process will fall on local and regional authorities, which will have to build the environmental infrastructure required and implement the relevant legislation". (Regional Environmental Center for Central and Eastern Europe, 2004 and Beyond Strategy Paper).

As seen through the lens of the logic of consequences, coordination of policy areas, such as the integration of environmental policy into other policy areas, policy recommendations is an exercise in negotiating sectoral interests to achieve coordination, but the result may be more akin to distributional bargaining. However if appealed to through the logic of appropriateness the goal will rather be the consideration of common norms and procedures for which to begin the process of policy coordination.

This process entails initially creating a culture and a will for integrated policy making and subsequently the formal and informal administrative channels for coordination in a segmented governance system. Regions in the Western EU are perhaps advantageously placed to engage in this activity, as they are often the more operationalised and formal links between national policies and local implementation.

However many of the regions of the enlargement area are still in the process of gaining administrative legitimacy.

Developing policy recommendations for addressing coordination of policy sectors must focus largely on regional and national institutional capacity, but also point out the links and networking possibilities between higher and lower levels of governance.

6.13 Comparing the rationales for policy recommendations

Principle-based policy combinations for adapting the norms of the ESDP and the ESPON programme take a top-down governance perspective and are addressed primarily to EU institutions; the Commission, the Council of Ministers, the European Parliament and the European Court of Justice. Following the logic of consequences, policy making will thus be an exercise in negotiating well-known sectoral and national interests. The core European spatial operational goals of polycentric spatial development, prudent management of natural and cultural heritage and equal accessibility to transport, communication infrastructures and knowledge under the logic of consequences are perhaps then best formulated with regard to the accession countries as areas for Structural and Cohesion fund support, specifically those dealing with:

- Innovation and the Knowledge Economy
- Education, employment and social support systems,
- Accessibility and services of general economic interest

Capacity-based policy combinations are addressed to the EU level in that these are prime areas for Structural and Cohesion Funds including the Interreg programme funding. Yet the added dimension is that the focus should also be on building capacity for within nation states and regions, with or without EU intervention. These recommendations are directed under the logic of appropriateness towards integration of EU norms and strengthening the EU identity, and constructed around helping governmental and non-governmental actors in the accession countries achieve appropriate actions for European spatial planning governance, specifically:

- Environment /risk prevention and Cross-sectoral integration
- Reinforcing the institutional capacity of national and regional administration
- Policy responses at national and regional level

We find that both rationales, while oriented towards two very different conceptual logics, are mutually reinforcing in both the actors to which they are directed and the typologies they portray. In the theoretical argument, either the logic of consequences or the logic of appropriateness will be dominant in how policy decisions are taken.

Hansenclever, Mayer and Rittberger (1997:155-156) assert that when actors follow the logic of appropriateness they ask themselves different types of questions. Instead of asking what course of action would have best consequences in light of individual goals and preferences (as in the logic of consequences), they ask instead "What kind of situation is this?", "Who am I?" and What is the best action for me in this situation?". Those actions that validate an actor's chosen or assumed identity will be seen as the most appropriate. The norms constituting the spatial development perspective of the EU and intersubjective understandings of identity will thus guide their actions. Yet it is empirically difficult to delineate when an actor's ideas and actions are operating under one or the other of the logics and this is not the purpose of this paper. However we find that the logics of consequences and appropriateness are more useful analytical tools for orienting a framework for to whom and what type of policy recommendations can be made. See the table below for a schematic view of policy combinations.

6.14 Conclusions: Enumerating concrete recommendations for making EU spatial development recommendations

In this discussion, we implicitly assume that current and – as suggested in the Third Cohesion Report - reformed EU policies in cooperation with rational national and regional responses, will be able to cope with the – enormously demanding and unprecedented in history - task of developing a more polycentric and coherent development in Eastern Europe in harmony with Western Europe in the course of enlargement.

However, coming back to Inotai's notion on the challenges facing enlargement because of the historically rooted and largely persisting characteristics of the new member states and the current Candidate countries, i e:

- A Buffer Zone over centuries between the current Pentagon and the eastern metropolitan centers Moscow, S:t Petersburg, Kiev and Istanbul
- Economic Periphery and Peripheralization at the new external border
- Cultural and Ethnic Diversity
- Disharmonic Top-down versus Bottom-Up Development Patterns
- Risk of restrictions to full and free mobility immediately after accession
- Modernization Anchor located Outside the Region

We cannot expect that previous policies applied in EU15 will be able to meet all the needs coming from enlargement regions. There is a strong demand for innovative policy and policy innovations at all levels. This leads to our final recommendation for policy combinations:

- Allow for much more experimental or ad hoc approaches to policy design and implementation
- Build in feed-back processes and process evaluation at all levels to achieve a continuously adaptive and learning system for reaching a more polycentric, sustainable and cohesive Europe.

6.15 Policy orientations for further targeting and deepening of multi level interaction in EU regional policy

We are addressing policy orientation to all three territorial levels. At the EU level, we recognize that the Commission has identified ten themes and territorial priorities where, it argues, the EU has a justifiable role: industrial areas undergoing conversion; urban areas in difficulty; areas facing specific geographical or demographic handicaps; cross-border, transnational and interregional co-operation; social inclusion; equality of opportunity; the new economy and knowledge society; and more and better jobs.

We also recognize that the Commission has adopted a proposal of five new regulations for renewed Structural Funds and instruments. Over the period 2007-2013, these instruments present about one third of the EU budget or a total of EUR 336.1 billion. The majority of this amount will be spent in less-developed Member States and regions. Structural Funds and instruments aim to promote growth-enhancing conditions for the Union's economy and will focus on three new objectives: convergence, competitiveness and co-operation.

Our policy recommendations are fundamentally in line with the Commission's principles and priorities, and aims at further targeting and deepening of the interaction between the EU level, the nation state, the regional and local levels in designing and focusing programmes and implementation practices. The principle rationale is basically a coordinated sector approach with a top-down perspective, while the capacity rationale is territorially based and largely following a bottom-up logic.

6.15.1 Principle-based policy combinations

As for concrete and combined policy actions, we recommend

- In a long term perspective, *transport infrastructure investments* in the new member states and particularly between new and old member states are of primary importance to increase competitiveness and cohesion in the EU as a whole. Large EU transport network investment will contribute to strengthen the capital regions of new member states and thus establish a more polycentric development at the European level.

- Infrastructure developments should also stregthen the potential *Transnational Region formed by the three small Baltic countries*. Deepened cooperation with the Russian enclave Kaliningrad is important for environmental concerns. Intensified networkning with St. Petersburg and Kiev is of high prioriety.
- Polycentricity at the European level should increase by *promotion of the network of major cities in the "Triangle of Central Europe"*, with its potentially high level of integration and encompassing the area from Warsaw in the east; Poznan in the west and Budapest in the south. This Trananational Region has to strengthen its relationships with the Pentagon, the wider Baltic area, Poland and the Balkan region.
- GDP growth in major cities and city regions in the new member states does not necessarily reduce unemployment or prevent social exclusion. This calls for for *intensified and focused urban policy programmes* for more and better jobs in both capital and second tier cities.
- Promote the *multiplier effects of R&D centers*. In many of the enlargement countries universities and research centers operate in isolation from their immediate surrounding, although their findings, innovations and ideas have the potential to be implemented locally.
- Large scale infrastructure improvements alone are not sufficient for significantly reducing the economic disparities between the old and new member states; they have to be integrated with other policies of the European Union. Transport policy scenarios examined in this report are likely to accelerate the decline in polycentricity within in the new member states and accession countries, i e overpromoting capital regions. This points at the need for *policies to improve the second rank cities' functions*.. This is in line with the suggestions put forward in ESPON 1.1.1 TIR. This is a field for cooperation between all the three levels, the EU, the nation state and the regional centres. Transport investment should not be concentrated only alongside international routes. Links connecting major centers between and inside new member states are almost if the same importance. Corridors concentrating both internal and international traffic should be a priority investment.

Each new member state should be invited to draft a *national programme for regional development with emphasis on the functional growth of second tier cities.* EU funding should be provided to partnerships formed at the regional level - both to draft the plan and to secure its implementation. Small member states should profit from drafting plans in cooperation with neighbouring states. Plans should be based on analysis of the potential function and contribution to positive spatial association of the second tier cities.

Such plans should include policies aiming directly to *generate employment* in second and lower order cities and towns (cf 1.1.3 SIR):

- Decentralize government employment
- Create new public institutions

A second group of policies focuses *new transport infrastructure* on selected cities:

- Intensively develop regional highway networks focusing on major regional centres
- Route new high speed rail lines to serve selected regions
- Intensively develop local transport accessibility, including sustainable transport options such as bicycle paths linking communities and regions.

A third group of policies builds on increasing importance of culture, leisure-based tourism and sporting activities to the economies of cities and regions:

- Attract major one-off events with longer term development potential
- Deliberately develop a cultural or tourist role based on existing natural and cultural resources in regional centers or second-tier cities. Development of tourist networking possibilities (natural, cultural, historic) for cities and regions with similar experiences
- Restore historic tourist quarters

6.15.2 Capacity-based policy combinations

A final group is more general in scope and address the issue of *creating "soft" lin*ks between functional regions in order to improve polycentricity, competitions, cohesion and sustainability by facilitating the exchange of information and knowledge between regions in and bordering the enlargement area.

This report highlights the improvement of transnational cooperation/networking as important means of counterbalancing concentration in the core of the EU, especially in the case of the enlargement countries where the ability to implement spatial development goals is may be low. The INTERREG III programmes and other EU external funding sources are currently addressing these issues. In light of this, policy combinations for capacity-building could include:

Macro level policy combinations:

- Explore the use of the **Open Method of Coordination (OMC)** as a mode of governance to a greater extent in EU spatial strategies. The call for this has already been heard[3] and with the non-regulatory character of spatial

[3] For instance, A. Faludi's call for linking OMC and Spatial planning "Spatial planning for the future development in the European Union" Paris, 20-21 January 2004. ULI Land Use Policy Forum Report.

development in the EU, the flexibility, openness and plurality of actors encouraged in the OMC, this may give some legitimacy to the inherent multi-level processes of spatial development. Particularly in the Accession countries, regional and local conditions are necessary prerequisites for developing national plans to encourage polycentricity and cohesion.

- **Fortified Rural Development Policy** focusing on the enormous needs in EU's *Rustic communities.* These regions are specializing on primary agriculture, have low income levels and slow rate of structural transformation towards secondary and tertiary sectors. They are more likely to experience poor economic growth rate in the near future than other agriculture dominated regions. To meet the needs in these and other agricultural regions, EU's RDP should be broadened to focus more on *sustainable rural development* and suggest possibilities to support funding the often risk-filled attempts to switch to more environmentally-friendly methods of agricultural production. The RDR budget in old and new member states should be adjusted to the particular needs for rural development and environmental management.
- **Extended Neighbourhood policy** should be directed towards the border areas that are handicapped for integration, ie those with an already low intensity of transnational activities and low economic disparities, or those that have difficult or inaccessible borders. As the European Neighbourhood Policy and New Neighbourhood Instrument are planned to take into consideration the "new" neighbours of the European space, efforts should be focused in conjunction with the Tacis and MEDA programmes.

Meso Level Policy combinations

- The national and regional level could benefit from **capacity-building for identifying developing and monitoring EU-funded cross-border, transnational and interregional projects** in the enlargement regions. Capacity building of regional and local administrations may be necessary to empower these regions with the skills needed to recognize opportunities and suggest plans for EU-funded projects, manage programmes and evaluate results. Development of communication mechanisms and methods to promote transparency and greater stakeholder participation are also key aspects of this capacity building.

- By means of national policies, extended social policy should be developed to **secure key service provision** in Europe´s Shrinking regions to make them more attractive. The EU should provide guidelines for which services should be considered as minimum standard for service accessibility in small town Europe. 'Shrinking' communities have poor demographic structure, negative

population trends and low population mass and density, will be less attractive for private investors and qualified mobile labour than other regions. We assume that such regions are involved in a negative spiral of cumulative causation, with declining regional markets for private the sector and increasing per capita costs for public services.

- At the national level encourage programmes to **increase cooperation *within* regions of the Enlargement countries,** dependent or independent from EU-funding. In many of the Enlargement regions, efforts go into transnational or transregional cooperative schemes, but the intra-regional cooperative forums need to be highlighted as opportunities for local exchange, benchmarking and mutual learning.

Micro-level policy combinations

- **Encouraging cross-sectoral capacity implementation at, regional and local levels**. While agendas and strategies for sustainable regional development in most of the EU address the importance of cross-sectoral issues (such as climate change) there are few tools to implement these. In this respect regional/local institutional or administrative capacity may benefit by the introduction of **horizontally placed *"Development Councils***" entrusted with the job of coordinating the expected effects of policy and planning on the normative objectives of competitiveness, cohesion and conservation (or the economic, social and environmental aspects of sustainability).
- Encourage **Local Agenda 21 plans** to adapt a spatial dimension to sustainable development, for instance the importance of accessible green corridors within and close to major urban areas, bicycle paths linking major transport hubs. Local Agenda 21 plans could also emphasize the importance of seeing the natural and cultural heritage as an economic asset, in terms of developing alternative energy sources, environmental innovations or cultural tourism.
- In regions/subregions facing severe problems ("fringe", "rustic" and "shrinking" communities) there is a need for an integrated development approach, in which the main axis/focus should be a settlement/urban-oriented policy, **applying the principle of polycentrism at local scale** (ie. townships, villages, hamlets). This would include cooperating and networking in complementarities, generating some thresholds and synergies at the very local level.

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4 Typologies of Needs

4.1 Regional Specialisation and Geographic Concentration in the Enlarged EU.

Elena Besussi

4.1.1 Vulnerability of regions due to increasing economic integration

The purpose of this analysis is to address the growing concern about the potential vulnerability of European regions due to increasing economic integration and globalisation. The main worry is that the processes of integration and globalisation may affect the degree of regional specialisation and the geographic concentration of economic activities.

If regional specialisation increases, industry-specific shocks may become region-specific shocks and sector-specific policies might become region-specific policies making regions more vulnerable. On the other hand, higher specialisation and greater concentration might lead to increased productivity via increasing economies of scale. Regional performance is also related to economic specialisation, even though the nature of this relationship changes with the economic sector and therefore caution should be used in making inferences between the positive or negative impacts of regional specialisation.

A common idea in the studies on the impacts of integration on regional specialisation is that the design of trade agreements and of infrastructure networks (as investigated in chapter 5 of this report) shapes the location advantages in terms of [accessibility to] markets. This has occurred in the case of NAFTA area where integration has led to an increasing advantage for border regions compared to core areas (such as Mexico City) because of their access to the US markets. In Europe, economic activities with large economies of scale have become more concentrated (measured via GINI coefficients) in the period 1980/90 (Brülhart and Torstensson, 1996).

Signals of increasing economic integration between new member states and the rest of the EU via increasing trade and foreign direct investments have been widely investigated in the literature (Raagmaa, 1996, for Estonia, Traistaru, 2002a, for Romania, Molle, 1997, for the EU15, Altomonte and Resmini, 1999, and Traistaru, 2002b for the Accession Countries). The impact of Structural and Pre-Accession Funds on regional performance and specialisation are also explored in the ESPON Programme (Project 2.2.2).

The analysis that follows is based the assumption that processes of integration and regional change are ongoing in the enlarged EU and suggests territorial typologies based on patterns and trends of regional economic structure. The objective is therefore not to provide further evidence of these processes but to identify which regions, under these circumstances, might be at risk of economic decline or potential success and to provide a framework for policy targeting.

4.1.2 Measuring Specialisation and Concentration

Regional specialisation and geographic concentration are usually analysed in terms of industrial production structures and industrial trade patterns. In that context the analysis is based on data on employment and GDP as well as on the amount of traded goods for the different manufacturing industries (in the European context these are usually the 22 two-digit NACE sectors); countries or regions are the standard geographic levels of reference. Many indicators have been developed to quantify these trends and a review is available in Aiginger (1999). Within that framework the following definitions apply:

- specialisation as the (distribution of the) shares of the industries in a specific country or region;
- concentration as the (distribution of the) shares of the regions or countries) in an individual industry.

Here we have adopted (and adapted) these definitions and a subset of the available indicators to the analysis of data on regional employment aggregated into three main economic sectors: agriculture (sectors A and B of the NACE classification), manufacturing (sectors C to F) and services (sectors G to P) for the period 1995 to 2001 for 260 NUTS2 regions (Bulgaria and Switzerland are excluded because of data limitations).

In the case of geographic concentration we have supplemented the selected regional indicators with "system-level" metrics that provide insights into the trends and patterns of the three different geographic systems: the EU29 (again, excluding Bulgaria and Switzerland), the EU15 and EU12. Table 4-1 provides a list of the indicators used.

Table 4-1: Indicators used in the analysis of regional specialisation and geographic concentration

E = employment s = share i = industry j = region	
Regional Specialisation	**Geographic concentration**
"Absolute" share: $s_{ij}^{s} = \frac{E_{ij}}{\sum_i E_{ij}}$ Herfindahl index of regional specialisation: $H_j^s = \sum_i (s_{ij}^s)^2$	"Relative" share: $s_{ij}^{c} = \frac{E_{ij}}{\sum_j E_{ij}}$ Aggregate percentage employment growth by sector Degree of concentration (measured as the slope of the rank-size curve) Change in the degree of concentration Ratio between the numbers of regions that have grown or declined

In the following section we are presenting the results of the analysis:

- regional specialisation describes changes occurring within regions and how they relate to regional performance
- geographic concentration describes changes occurring between regions and at the wider geographic scales in terms of trends towards concentration or dispersion.

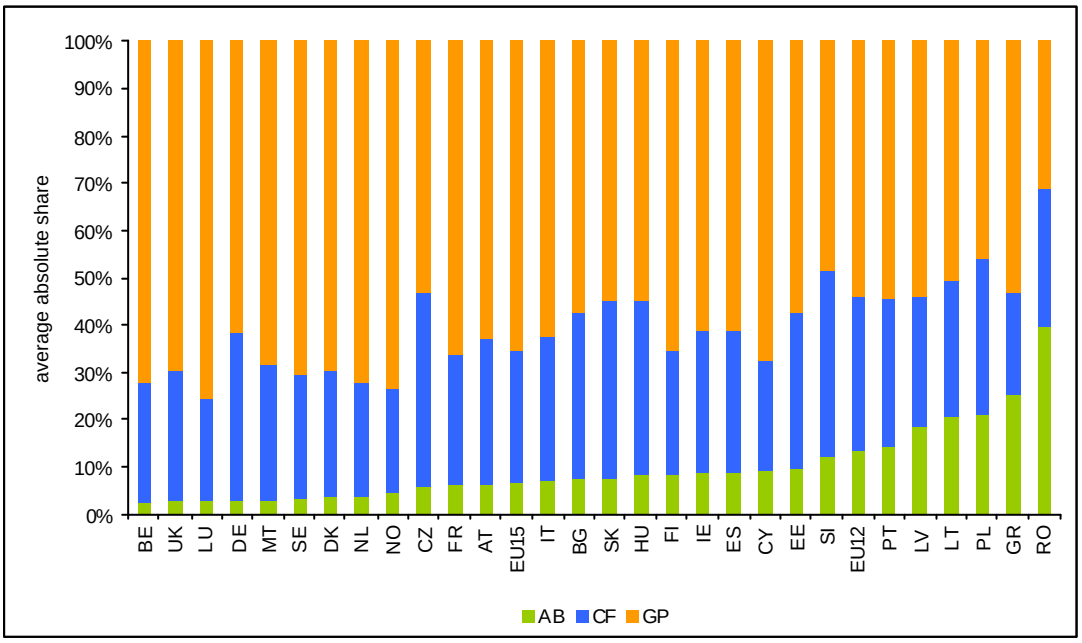
4.1.3 Regional Specialisation

To introduce the analysis on patterns of regional specialisation it is useful to provide an overall picture of the situations at the European level in terms of employment shares in the three economic sectors.

Figure 4-1 shows how most of the EU12 have relatively high shares of employment in the primary sectors with lower-than-average shares in the service activities[1], whereas in most of the EU15, services dominates the regional employment structure. Greece and Portugal are the "old" member states which are more similar to the EU12 average and Cyprus, Malta and Hungary are closer to the EU15 model.

These structures are all undergoing a fast transition characterised by a shift towards the service sectors. At the EU scale, against a 4.5 percent aggregate employment growth 1995-2001, the service sectors have increased by 7.7 percent; at the EU15 scale aggregate and service sector growths amounts respectively to 6 and 8 percent and at the EU12 to percent and percent. The other two sectors considered show either decline or stability.

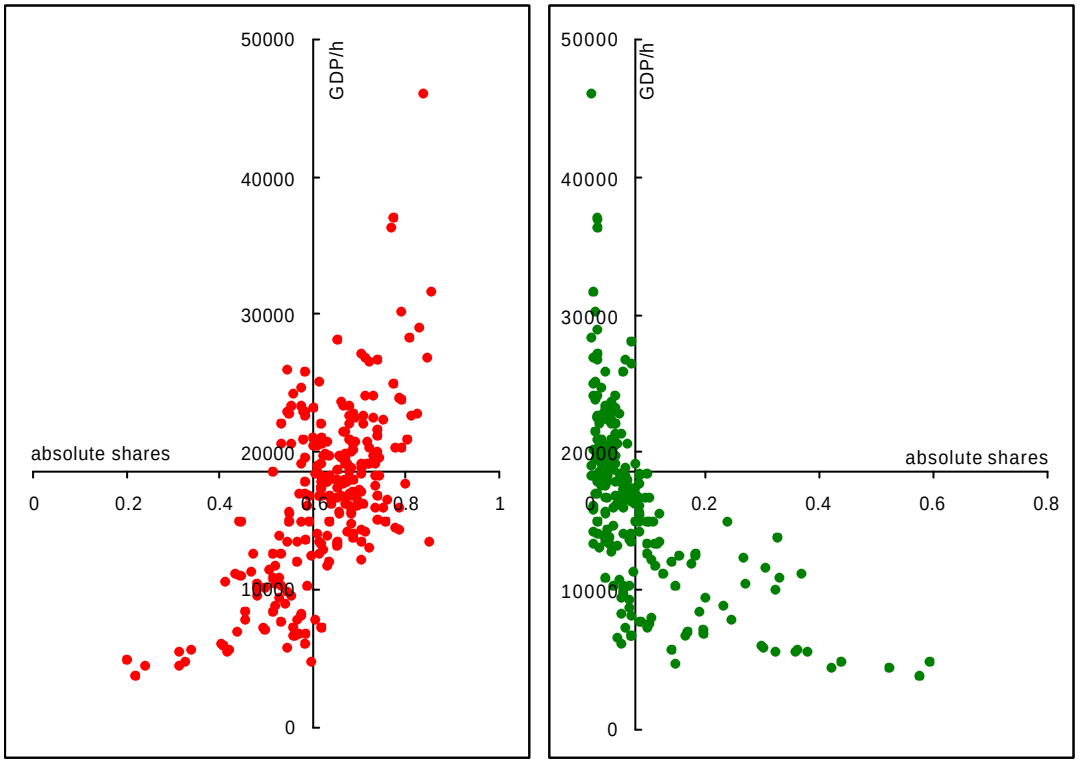
Figure 4-1: Average absolute shares by country, EU12 and EU15 and by sector in 1995



[1] Because of the economic classification used in the analysis, the service sector include both base and non-base services. However these two sub-sectors have different growth patterns and dynamics: the latter can reasonably be assimilated to administration and public services and therefore is linked to population distribution patterns whereas the former tends to have higher levels of location mobility.

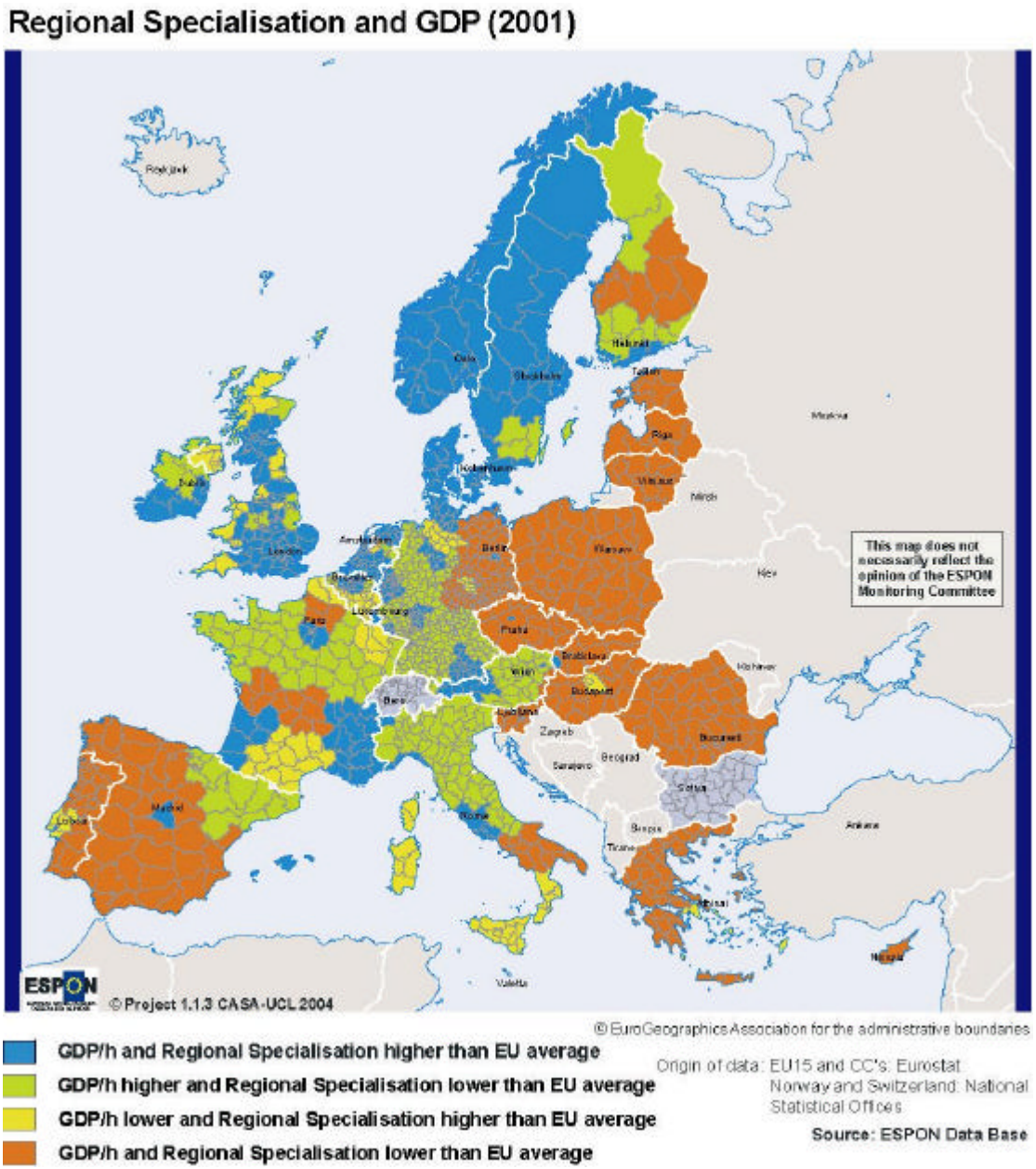
At the regional (NUTS2 level) the results show that higher shares in the service sectors have a strong and positive correlation with higher levels of GDP per capita but for the agriculture sector (and, to a lower degree, the manufacturing sectors) this relationship is reversed (Figure 4-2). There is however no significant relation between absolute shares (in any economic sector) and the size of the NUTS2 regions measured either in terms of sector or total employment.

Figure 4-2: Correlation between GDP/h and employment shares in services (left) and agriculture (right). Axes cross at average values for both indicators



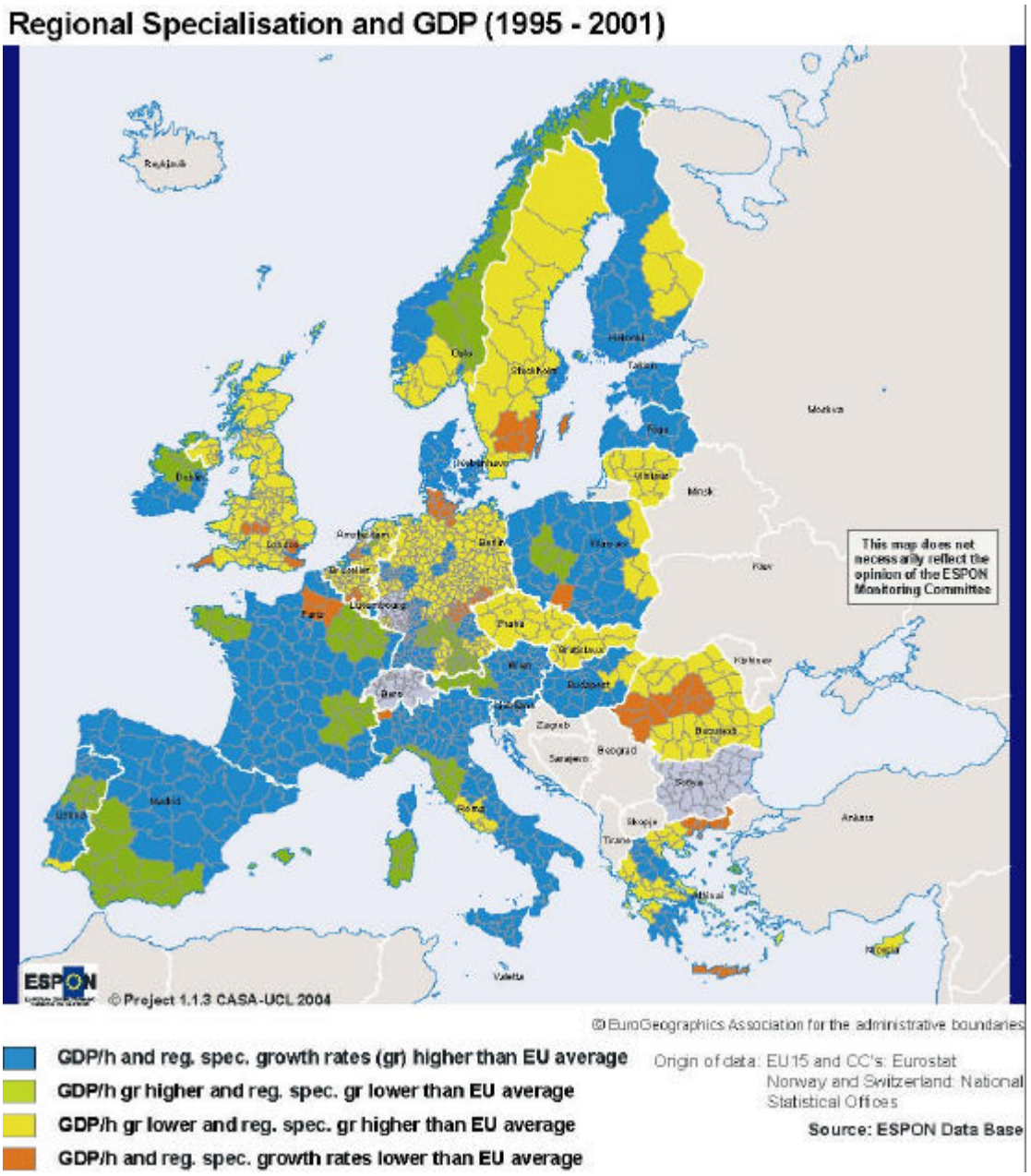
Map 4-1 shows a preliminary territorial typology based on each region's positions relative to EU averages in GDP/h and overall regional specialisation (Herfindahl index). The map shows a significant core/periphery pattern.

Map 4-1: Typologies of regional specialisation and GDP per capita - 2001 (EU average 18,900€ Purchasing Power Standards per capita)



With regards to trends (measured as yearly growth rates) there is no significant correlation between neither size nor change in size (measured both as employment and GDP) and change in the degree of specialisation. This absence of statistical relation however still leaves room for reflecting around the fact that there are regions which are specialising and increasing their GDP/h, regions where GDP/h is growing in a context of de-specialisation and regions where above average growth in specialisation is not accompanied by above average growth in GDP/. Map 4-2 shows how these regional typologies are distributed across the ESPON space.

Map 4-2: Typologies based on trends of regional specialisation and GDP per capita growth, 1995 - 2001 (EU average compound GDP/h growth rate = 1.1)



These analyses and the associated typologies should not be considered a substitute for a more rigorous convergence analysis (see chapter 3.2). The typology presented are nonetheless useful to reveal patterns where regions characterised by low specialisation and GDP (in Spain and Poland, for instance) are experiencing higher GDP/h growth rates and faster specialisation growth than the EU average while for most of the UK these indicators are reversed. These realities call for the use of caution in the evaluation of policies: *not all regions will respond equally to policies that promote specialisation or differentiation of the economic structure.*

4.1.4 Geographic concentration

The role of the analysis of geographic concentration within the context of the ESPON 1.1.3 project is to measure and map the degree and trends of concentration/dispersion occurring in the different economic sectors and to evaluate differences in these structures between three geographical systems: the ESPON space, the EU15 states and the EU12 states.

This analysis therefore deviates from the traditional methods of study for geographic concentration whose main focus is the performance of the individual industry or sector.

To support our analysis we have identified four dimensions according to which the geographic systems/economic sectors can be measured.

Dimension 1: Percentage growth of the sector aggregated at the reference geographic system for reference time period (1995-2001). This dimension gives information on the change in the overall "size" of the systems and whether these are contracting or expanding.

Dimension 2: slope of the linear log-log graph of the rank size distribution where size is measured as regional employment. This dimension describe the degree of concentration / dispersion of a geographic systems. If the value of the slope is near –1, the systems is known to be behave according to the Zipf's Law. It is useful to note that, according to the rank-size rule, a system that is concentrating, often implies that the "small" regions are becoming smaller and the big are becoming bigger. We have therefore supplemented this analysis with charts that plots regions according to sectoral employment size and employment change over the reference period to improve the description of concentration/deconcentration processes..

Dimension 3: Absolute change (1995-2001) in the slope of the rank-size distribution (as described above). It provides insight into the trends towards concentration/dispersion in the different systems. A negative change means an increase in the slope and therefore an increase in concentration.

Dimension 4: "Growth ratio", that is the ratio between the numbers of regions that have grown or declined (in terms of absolute sector employment) in the reference period (1995-2001). Alternatively, the dimension could be based on the change in the "relative" share s_{ij}^{c} as described in Table 4-1.This dimension provides additional information on the internal instabilities of the systems. As we will see, there are systems that appear "static" according to dimensions 1 and 3, whereas dimension 4 shows underlying regional changes.

Table 4-2 lists the values for these indicators in the three geographic systems (ESPON space, EU15, EU12) and for the three main economic sectors.

Table 4-2: The four dimensions for the analysis of geographic concentration

	D1	D2	D3	D4 (absolute change)
Primary sectors				
ESPON space	-3%	-1.2	-0.03	35% / 65%
EU15	-5%	-0.9	-0.03	35% / 65%
EU12	-1.2%	-1.4	-0.1	40% / 60%
Secondary sectors				
ESPON space	-0.3%	-0.7	0	50% / 50%
EU15	2%	-0.8	0	50% / 50%
EU12	-6.7%	-0.5	+0.05	30% / 70%
Service sectors				
ESPON space	+7.7%	-0.8	-0.02	80% / 20%
EU15	+8%	-0.8	0	85% / 15%
EU12	+6%	-0.4	-0.02	60% / 40%

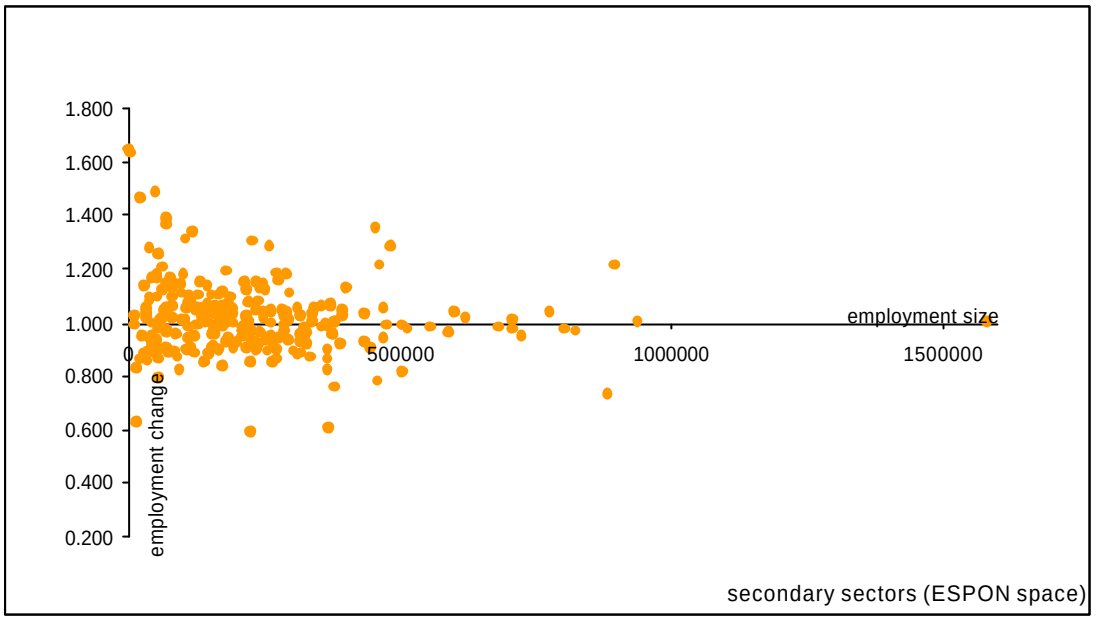
The comparative analysis of the three systems and the three sectors according to these four dimensions has identified 5 typologies of systems.

Case 1 (applies to the ESPON space and the EU15 and to the secondary sectors).

D1 = 0%; D2 = -0.8%; D3 = 0; D4 = 50/50

These systems have not experienced any significant growth or structural change in the last five years (D1 and D3) but according to D4 during this period half of the regions has increased its total employment whereas the remaining half have declined. These changes have mainly occurred in the small and medium regions because any significant change in the largest ones would have been reflected in a change in the degree of concentration. Growth rates are ranging from 0.6 to 1.6 (where 1.0 means no growth). These movements of growth and decline compensate each other to keep the systems in an overall static state.

Figure 4-3: Correlation between employment change and size in the service sectors across the ESPON space



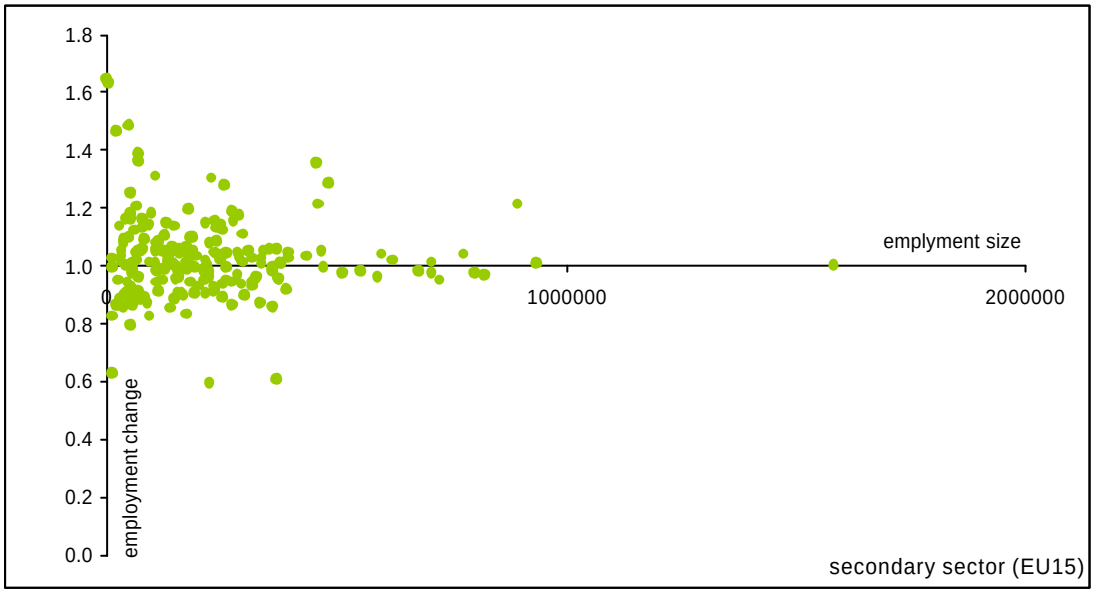
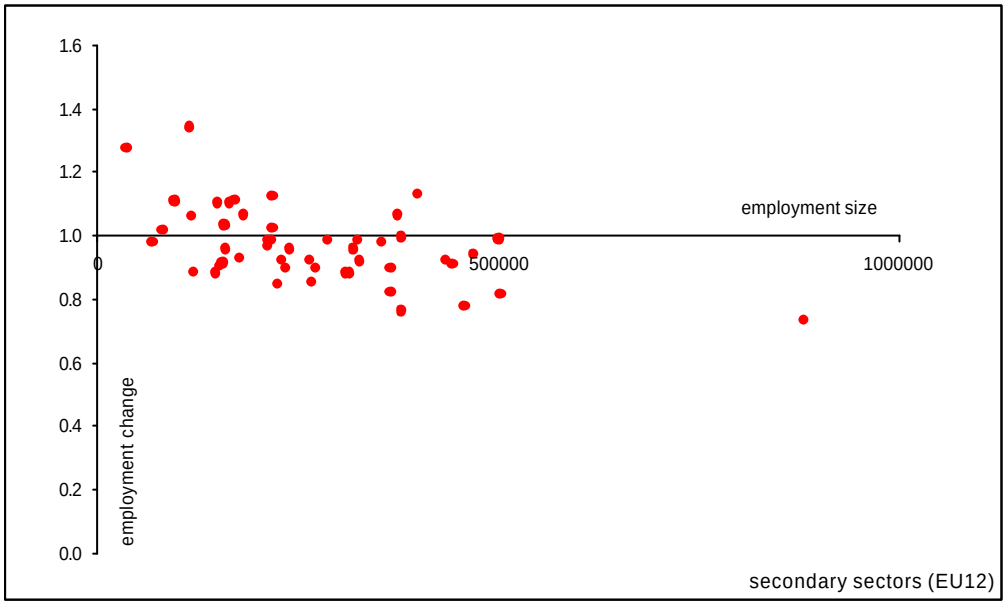


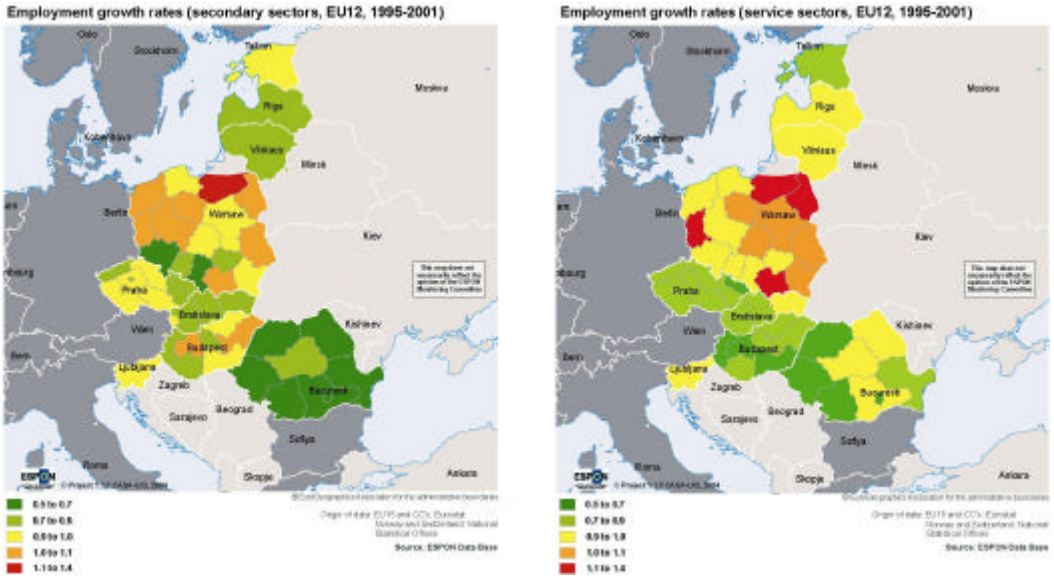
Figure 4-4: Correlation between employment change and size in the service sectors across the EU15

Case 2 (applies to the EU12 and to the secondary sectors).
D1 = -7%; D2 = -0.4%; D3 = +0.05; D4 = 30/70

This is a system that is at the same time declining and deconcentarting. As shown in Figure 4-3, the largest regions (in terms of sector employment) are the ones with the highest decline rates while the smallest have grown up to 40% in six years. However big these increases might be they do not compensate the loss of the largest regions and the system is declining. Because sector employment is used as a measure of size, small should not be interpreted as peripheral. Map 4-3 shows a detail for the EU12 of the regional growth rates for the secondary sectors.

Figure 4-5: Correlation between employment change and size in the service sectors across the EU12





Map 4-3: Employment growth rates for the period 1995-2001 in the new member states in the secondary sectors (left, NACE sectors C to F) and service sectors (right, NACE sectors G to P)

Case 3 (applies to the ESPON space and the EU15 and to the service sectors).

D1 = 7-8%; D2 = -0.8%; D3 = 0; D4 = 80/20

These systems are significantly growing but are not concentrating more than what they already are. Most of the regions have experienced growth and only few (20%) haven't. The latter are mainly the largest regions in the systems. The systems are therefore static "at the top" and keeping their structures in a context of the overall growth.

Figure 4-6: Correlation between employment change and size in the service sectors across the ESPON space

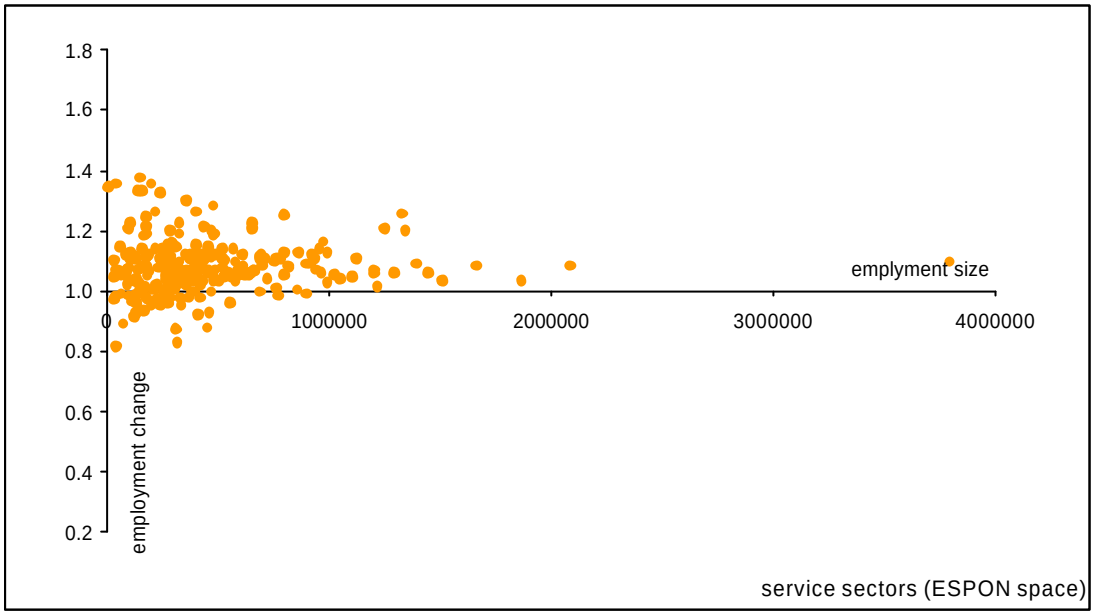
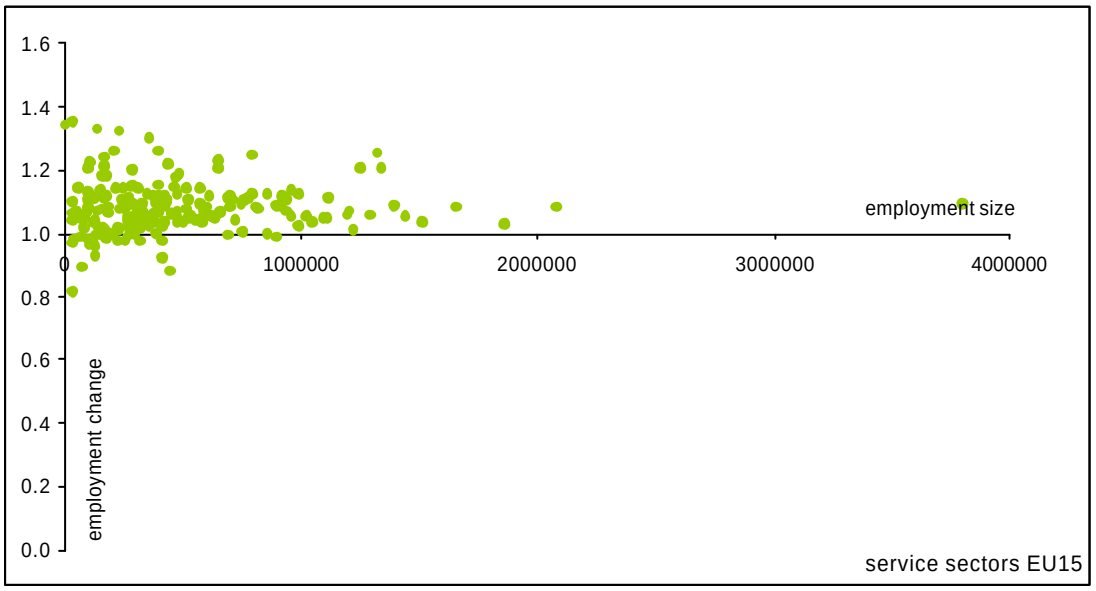


Figure 4-7: Correlation between employment change and size in the service sectors across the EU15



Case 4 (applies to the EU12 and to the service sectors).

D1 = 6%; D2 = -0.4%; D3 = -0.02; D4 = 60/40

This case is very similar to the two previous systems but because the system starts from a decentralised structure and there is a minor shift towards more concentration, the regions that are growing are the largest and the smallest in the system (with the large growing slightly more than the small ones) and the ones declining are the medium sized ones.

Case 5 (applies to all the geographic systems and to the primary sectors).

D1 = -1% to -5%; D2 = -1 to –1.4; D3 = -0.03 to –0.1; D4 = 35/65

These systems have a high degree of concentration and trends show that this concentration is increasing. The trend towards concentration is particularly strong for the EU12. Since the systems are also losing overall employment and therefore contracting, in order to produce the increase in concentration, decline is occurring in the smallest regions and growth in the biggest. While at the ESPON space scale the "largest" regions (measured by the "relative" shares of sector employment) are in the EU12 (mainly Romania and Poland) and the rest of the regions appear to have low shares, by separating the two systems, the regions of southern Spain and Italy, as well as the north of Greece and Portugal emerge as the leading regions in the sectors. These patterns however are more easily evaluated when these indicators are mapped (Map 4-4 and Map 4-5) rather than plotted (Figure 4-6and Figure 4-7).

Figure 4-8: Correlation between employment change and size in the primary sectors across the EU15

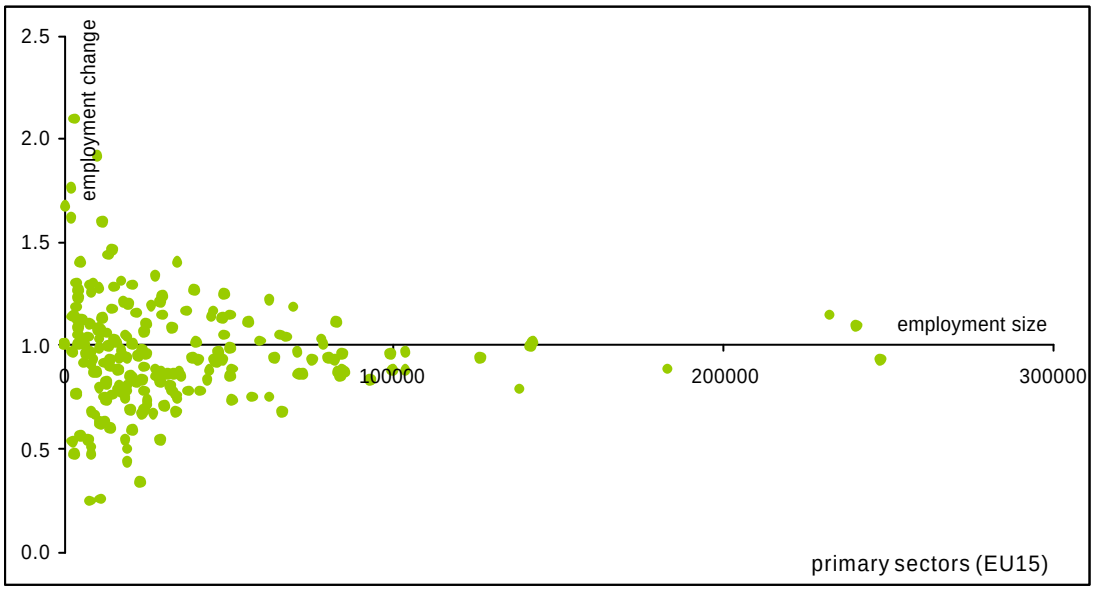
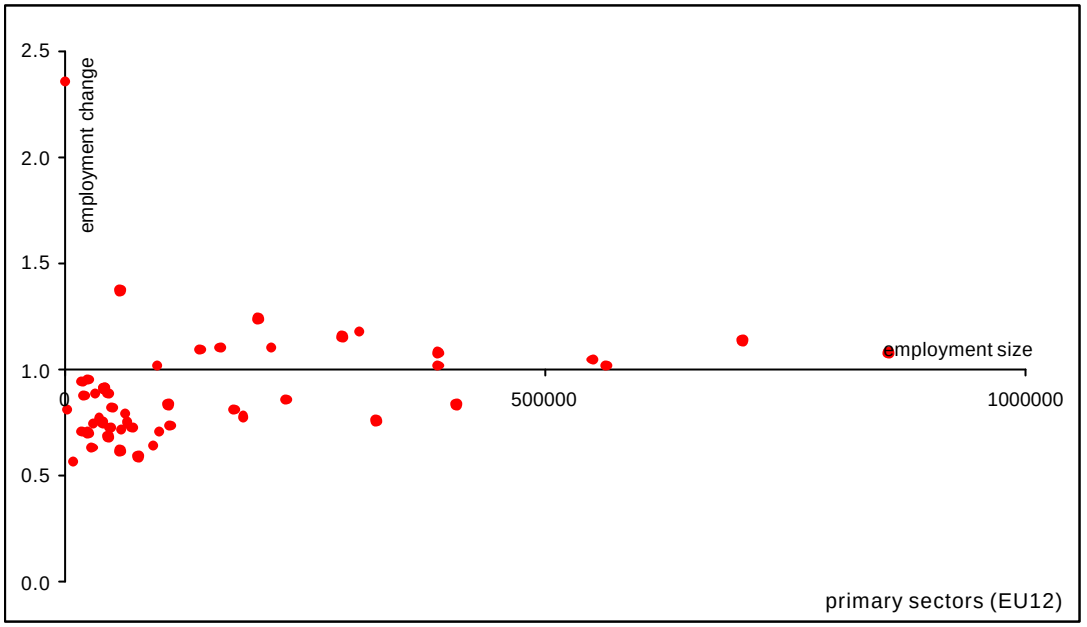
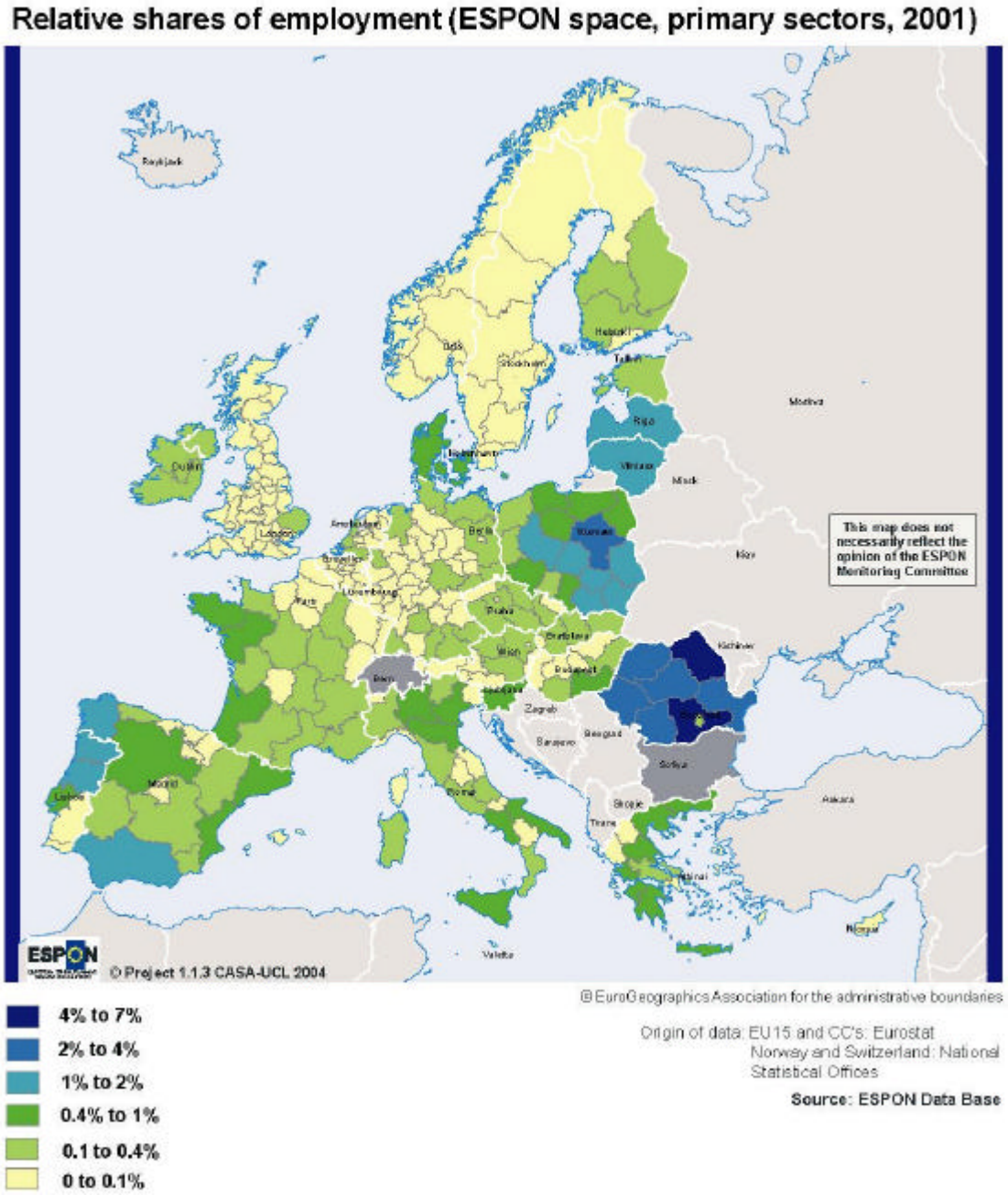


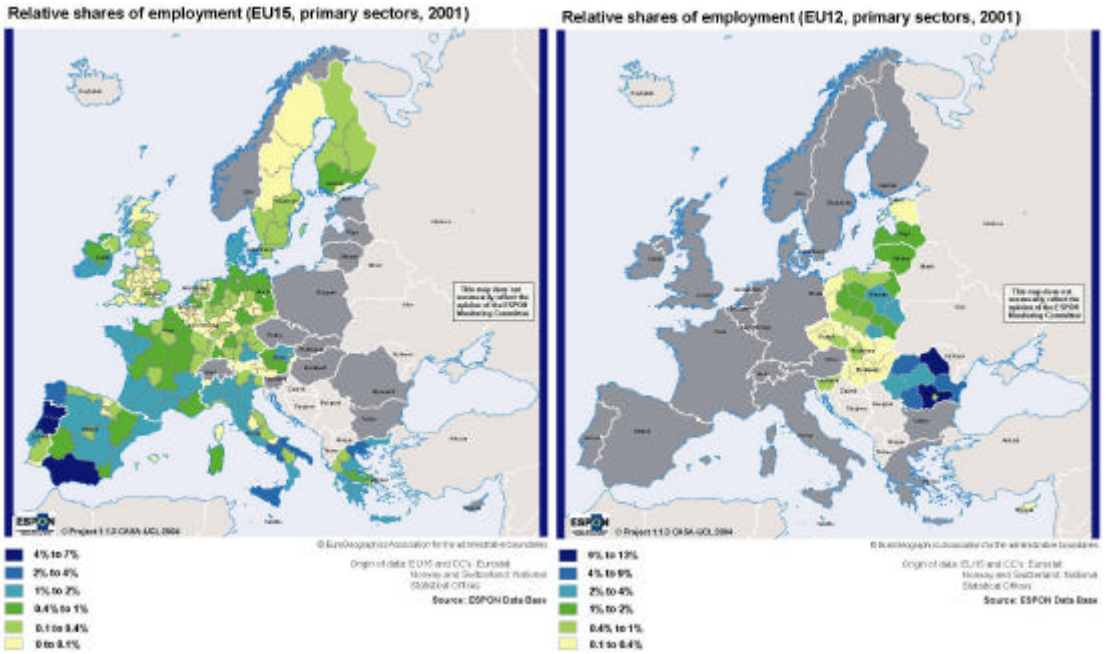
Figure 4-9: Correlation between employment change and size in the primary sectors across the EU12



Map 4-4: "Relative" shares of employment in the primary sectors measured across the ESPON space



Map 4-5: "Relative" shares of employment in the primary sectors measured across the EU15 and EU12 spaces separately.



4.1.5 Possible Policy Combinations and Further Research

The comparative analysis of geographic concentration shows that most of the transformations that are occurring within the EU15 (growth of the service sectors, decline of employment and increase in concentration in the primary sectors, decline of employment and dispersion in the secondary sectors) are also occurring in the new member states. But within the boundaries of the EU12 geographic system these transitions have both a *faster pace and a stronger manifestation.* Some of this differences can only be revealed if the EU15 and the EU12 are kept as separate systems, since their interpretation as a unique entity tends to blur the difference of both.

This leads to the tentative conclusion that policy combinations at EU, national and regiional level already implemented in EU15 to strengthen positive specialization – where appropriate – or diversification – where that is the apppriate remedy - in principle could be expected to work also in the new member states. However, we should bear in mind that the scale of this round of enlargement, the great economic and social gap between the old and new member states and the dominating divergence trend in EU10 (as shown in Section 3.2 (Jos)) in contrast to convergence in many EU15 states, poses an uprecedented challenge. A very plausible policy recommendation is that since the needs are much stronger in the new member states than in the past, the policy has do be loaded with much more and concentrated resources than in the past to be efficient.

In the Final Interim Report we will develop these analysis in three different directions:

1. Compare the analysis of regional specialisation based on employment with the analysis based on GVA in the three sectors. This will provide a better picture of regional specialisation in terms of economic outputs and performance.
2. Deepen the level of analysis to the NUTS3 level
3. Extend the analysis of geographic concentration investigating and comparing individual countries as separate systems

4.2 Targeting policy combinations to meet the needs after enlargement

Jörg Neubauer, Lars Olof Persson

4.2.1 Where and why do spatial problems tend to subsist? - Empirical evidence from previous enlargements

The European Forecasting Network published in Spring 2003 a report on the Euro Area Outlook, which among other things gave a picture of the spatial effects of previous enlargement waves. From this report, along with the case study on Portuguese accession launched in our SIR will help us enumerate some of the problems that enlargement as a process has posed for previous new member states.

For regions in the 1980s enlargement wave (Greece, Spain and Portugal) regions in these countries tended to increase their differences and to polarise their behaviour towards their own group's average value. The better-positioned regions in these countries have tended to move towards EU15 levels, while the poorest regions have not. EFN calls this the "development trap".

EFN summarizes that generally regions that have diversified sectoral structure, high tech industries and relatively high R&D expenditures together with qualified labour could benefit from integration to improve their positions, but regions that tended to specialize in the agricultural sectors and low tech, low R&D industries, with lower-skilled workers tended to be caught in the development trap. This is also echoed in section 3.4 of this report (above). EFN also reported that despite infrastructure improvements, there was a negative correlation between distance from the European Core and GDP/capita.

The experience of the Portuguese accession to the EU in 1986 depicted in our SIR (Aug, 2003) has shown that European integration has stimulated economic growth and social well-being in Portugal as a whole, regional imbalances are still quite strong and can generally be described as a costal/interior (or urban/rural) divide. Structural Funds have been extremely important in Portugal in decreasing time and costs distances to the European Core, as well as boosting intra-regional accessibility, but apparently economic cycles in the European economy may be even more influential to the convergence that is happening, than is European funding. Portuguese integration into the EU precipitated a decline of traditional sectors, but

has created new opportunities in more knowledge and capital intensive industries, although the pattern of regional disparities have not changed significantly.

4.2.2 The Enlarged EU's Fringe, Shrinking, Rustic and Rustbelt Communities in need of Policy Combinations

Throughout the previous sections of this chapter we have elaborated spatial relevant development trends affecting the ESPON space. Along with each trend comes the pressure to adapt to changes leading to reorganisation of the national and European urban system(s) at varying speeds and levels. The outcome of reorganisation, however, will be different for different structural types of regions and will also depend on which impact integration forces issuing from enlargement (Europeanisation) may have.

4.2.2.1 How to identify regions needing extra support?

Against this background we set out to apply a composite perspective asking where in the ESPON space there are structural types of regions that may be in need of various policy interventions to attain the normative territorial goals of competitiveness and cohesion, in particular when taking into account the EU's enlargement. Hereby we seek to identify parts of the territory which are likely to be problematic in the development of a spatially balanced polycentric structure, allegedly crucial to contributing to realisation of these normative territorial goals. The policy implications given for each typology sketch, however, are of a very speculative nature at this point and are mainly intended to give some idea of what types are interventions may be analysed in the Final Report.

4.2.2.2 Principles for the typology

In order to target the regions of the ESPON space we focus on those characteristics allowing for complete quantitative observation at NUTS 3 level. Assumptions are made for particular types of regions for which enlargement may mean extraordinary pressure to reorganise their urban structure in a way counteracting the development of a balanced polycentric spatial tissue across the ESPON space. Each typological scoping is approached as follows:

- *Step 1: Formulating a hypothesis on problematic structural types of regions.*
- *Step 2: Deriving a set of indicators suitable to identify those regions.*
- *Step 3: Classifying regions by combination of extreme indicator values.*

The indicator set comprises five indicators, which depict one regional characteristic relevant to the assumption made. By looking at the extreme indicator values it can be ascertained firstly, to which extent the structure of a region may be problematic within the context assumed (i.e. number of indicator values in highest or lowest quartile) and secondly, which characteristic(s) are most relevant to give the region a problematic structure (i.e. type of indicator value(s) in highest or lowest quartile). The more extreme indicator values (positive or negative) are evident in regions that may be more exposed to the assumed effect of enlargement.

4.2.3 Draft typologies mapping regions with problems/needs in reaching the 3 objectives

The draft typologies identify regions that are likely to be affected negatively by enlargement. It is observed how many of the five indicators do have their values in the lowest quartile. At the same time there are also regions that will experience positive impact of enlargement. Both types of regions should be discussed together if one aims to conclude on policy needs to develop e.g. a balanced polycentric tissue. However, this remains to be incorporated.

The following four structural types of regions may be in particular problematic:

4.2.3.1 Typo 1: EU's 'Fringe' communities:

Ceteris paribus, regions with peripheral location, low population density, low level of economic wealth and currently slow growth rate are expected to be less attractive for private investors and qualified mobile labour than other regions. We assume that low level of wealth and slow growth in the recent past reflects poor competitiveness of the regional economy in a situation where international competition was less fierce than in the enlarged EU. We also assume, and based upon experiences of previous enlargement, that the centre – periphery pattern will be accentuated as competition is strengthened.

Three groups of indicators are used to distinguish EU's 'Fringe' communities (regions), namely accessibility indicators, population indicators and economic indicators. The complete set is listed in Table 4-3. Low indicator values (or decrease) indicate 'Fringe' characteristics.

Table 4-3: Indicators for Typo 1

I11	Accessibilty (European+EU15+AC12+National dimension)	2001
I12	Population density (inhabitants/km²)	2000
I13	Total population	2000
I14	GDP (PPS) per capita	2000
I15	GDP (PPS) per capita, relative change to EU15 average	1995-2000

Map 4-6 depicts EU's 'Fringe' communities. Indicator I11 (accessibility) is used without the national dimension, which remains to be incorporated. There are no extreme 'Fringe' communities in the ESPON space having all five indicator values in the lowest quartile. However, some three percent of the ESPON space NUTS 3 regions have at least four indicator value low points. An overview on the characteristics of the EU's 47 extreme 'Fringe' regions is given in Table 4-4. These regions are mainly located in Romania, Bulgaria, Greece, Portugal, Scotland and in the coastal parts of East Germany. Furthermore Haute-Alpes in France, the Swedish regions of Jämtland and Gotland as well as Kainu and Itä-Uusimaa in Finland also belong to this group. The region of Itä-Uusimaa located adjacent to Helsinki receives its strong 'Fringe' status mainly due to a small total population and a relative decrease of its GDP (PPS) per capita as compared to the EU15 since the population strongly increased in the period in question.

Map 4-6: EU's 'Fringe' communities

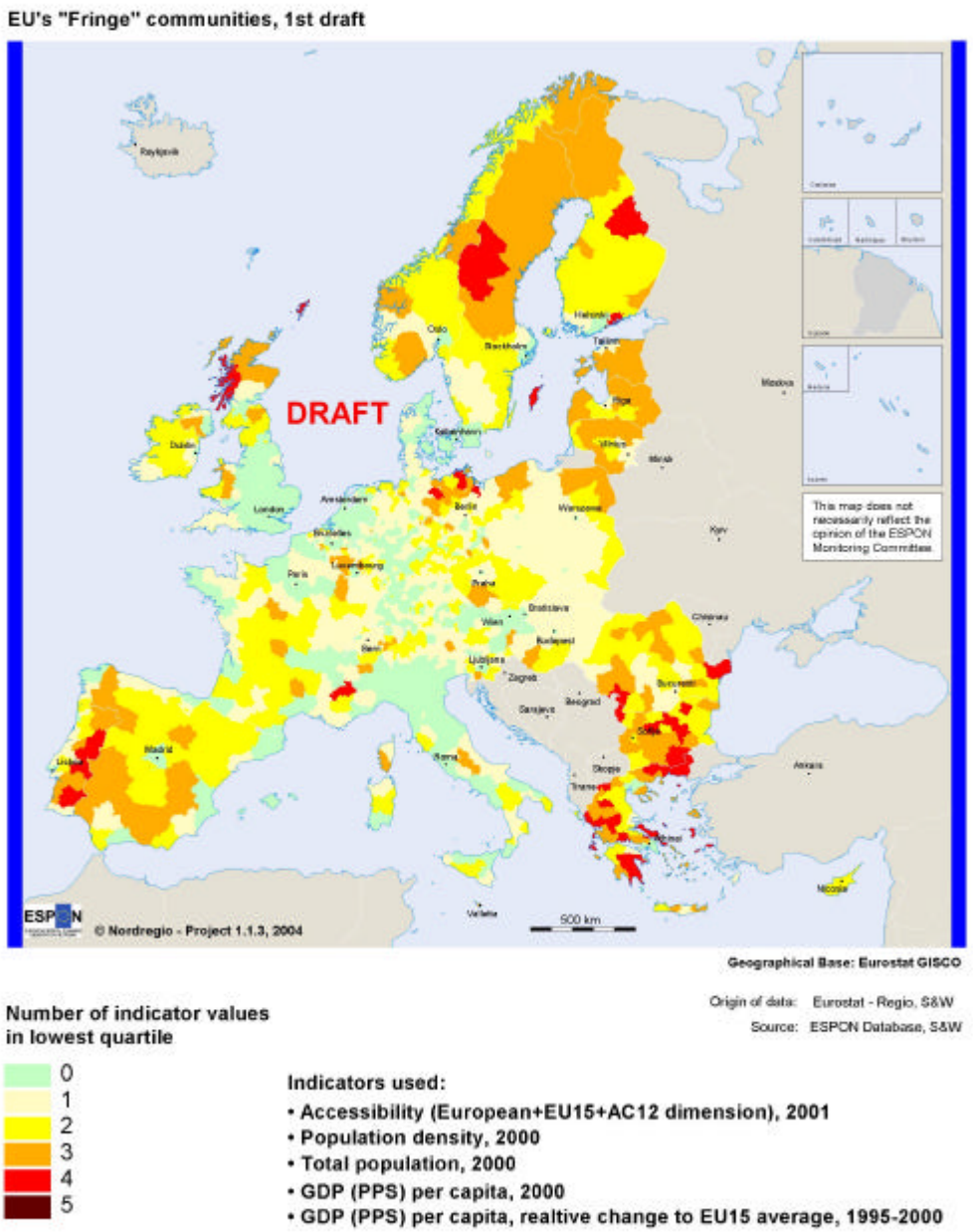


Table 4-4: The EU's extreme 'Fringe' communities and their characteristics (Q1=indicator value in highest quartile, Q4=indicator value in lowest quartile)

NUTS 3	Region	I11	I12	I13	I14	I15
BG011	VIDIN	Q4	Q4	Q3	Q4	Q4
BG022	LOVECH	Q4	Q4	Q3	Q4	Q4
BG023	VELIKO TARNOVO	Q4	Q4	Q2	Q4	Q4
BG035	RAZGRAD	Q4	Q4	Q3	Q4	Q4
BG053	HASKOVO	Q4	Q4	Q2	Q4	Q4
BG056	KARDZHALI	Q4	Q4	Q3	Q4	Q4
BG062	SLIVEN	Q4	Q4	Q3	Q4	Q4
DE808	DEMMIN	Q4	Q4	Q4	Q4	Q3
DE80A	LUDWIGSLUST	Q3	Q4	Q4	Q4	Q4
DE80D	NORDVORPOMMERN	Q4	Q4	Q4	Q4	Q3
DE80I	UECKER-RANDOW	Q3	Q4	Q4	Q4	Q4
FI134	KAINUU	Q4	Q4	Q4	Q3	Q4
FI162	ITA-UUSIMAA	Q4	Q4	Q4	Q2	Q4
FR822	HAUTES-ALPES	Q4	Q4	Q4	Q2	Q4
GR111	EVROS	Q4	Q4	Q4	Q4	Q1
GR112	XANTHI	Q4	Q4	Q4	Q4	Q3
GR113	RODOPI	Q4	Q4	Q4	Q4	Q2
GR114	DRAMA	Q4	Q4	Q4	Q4	Q3
GR131	GREVENA	Q4	Q4	Q4	Q4	Q1
GR134	FLORINA	Q4	Q4	Q4	Q4	Q1
GR141	KARDITSA	Q4	Q4	Q4	Q4	Q1
GR211	ARTA	Q4	Q4	Q4	Q4	Q3
GR212	THESPROTIA	Q4	Q4	Q4	Q4	Q2
GR214	PREVEZA	Q4	Q4	Q4	Q4	Q3
GR223	KEFALLINIA	Q4	Q4	Q4	Q4	Q1
GR224	LEFKADA	Q4	Q4	Q4	Q4	Q1
GR242	EVVOIA	Q4	Q4	Q3	Q4	Q4
GR243	EVRYTANIA	Q4	Q4	Q4	Q4	Q2
GR245	FOKIDA	Q4	Q4	Q4	Q4	Q2
GR251	ARGOLIDA	Q4	Q4	Q4	Q4	Q1
GR252	ARKADIA	Q4	Q4	Q4	Q4	Q1
GR254	LAKONIA	Q4	Q4	Q4	Q4	Q1
GR412	SAMOS	Q4	Q4	Q4	Q4	Q1
GR413	CHIOS	Q4	Q4	Q4	Q4	Q1
PT126	PINHAL INTERIOR SUL	Q4	Q4	Q4	Q4	Q1
PT127	SERRA DA ESTRELA	Q4	Q4	Q4	Q4	Q2
PT128	BEIRA INTERIOR NORTE	Q4	Q4	Q4	Q4	Q2
PT129	BEIRA INTERIOR SUL	Q4	Q4	Q4	Q4	Q3
PT12A	COVA DA BEIRA	Q4	Q4	Q4	Q4	Q2
PT142	ALTO ALENTEJO	Q4	Q4	Q4	Q4	Q3
PT144	BAIXO ALENTEJO	Q4	Q4	Q4	Q4	Q3
RO025	TULCEA	Q4	Q4	Q2	Q4	Q4
RO043	MEHEDINTI	Q4	Q4	Q2	Q4	Q4
SE072	JAEMTLANDS LAEN	Q4	Q4	Q4	Q2	Q4
SE094	GOTLANDS LAEN	Q4	Q4	Q4	Q3	Q4
UKM43	LOCHABER, SKYE AND LOCHALSH AND ARGYLL AND THE ISLANDS	Q4	Q4	Q4	Q3	Q4
UKM46	SHETLAND ISLANDS	Q4	Q4	Q4	Q1	Q4

Policy implications for "Fringe Regions"

Fringe regions tend to be located at just the periphery of the European space. Primarily due to their low population density and their distance from major hubs of economic activity (with important exceptions for Portugal, Greece and Finland) it could be assumed that these areas are important areas of natural conservation and/or experience relatively few pressing environmental problems in the rural areas. Therefore any policies attempting to increase accessibility and economic growth in these areas should be careful to not do this at the expense of nature or cultural landscapes and this may be a fine line to tread. At the same time

the problems associated with social cohesion may be the most pressing problems requiring Structural fund intervention and national policy interventions.

By means of national policies, extended social policy should be developed *to secure key service provision* in Europe´s Shrinking regions. The EU should provide guidelines for which services should be considered as minimum standard for service accessibility in small town Europe. Extended Neighbourhood policy should be addressed to the Fringes and Border regions of the enlarged EU.

4.2.3.2 Typo 2: EU's 'Shrinking' communities:

Ceteris paribus, regions with poor demographic structure, negative population trends and low population mass and density, will be less attractive for private investors and qualified mobile labour than other regions. We assume that such regions are involved in a negative spiral of cumulative causation, with declining regional markets for the private sector and increasing per capita costs for public services.

The EU's 'Shrinking' communities typo focuses on the regional demographic structure. Thus different demographic indicators are used. The complete set is listed in Table 4-5.

Table 4-5: Indicators for Typo 2

Population change	1999-2000
Demographic Dependency ratio	1999
Net migration rate	1999
Natural change	1999-2000
Activity rate 15-64 years	1999

Formel 4-1 EU's 'Shrinking' communities. First sample of results. Regions with at least 3 indicators scoring in the extreme quartiles. NB.Missing data for some indicators will be completed in the Final Report. Preliminary calculation provided by Daniel Rauhut, ITPS**.**

Year 1999, bold 2000	**Natural pop change per 1000 inh**	**Dependency ratio**	**Net mig rate per 1000 inh**	**Activity rate 15-64**	**Population density per sqr km**
dk00e Viborg amt	0,86	1,72	-1,79	na	56,70
gr21 Ipeiros	-2,13	1,66	6,66	61,70	40,80
gr24 Sterea Ellada	-2,42	1,64	2,11	63,90	42,60
gr41 Voreio Aigaio	-4,37	1,83	2,73	59,00	47,70
es41 Castilla y León	-3,43	1,67	1,58	62,90	26,30
es42 Castilla-la Mancha	-0,29	1,73	2,29	63,00	21,50
es43 Extremadura	-0,37	1,72	0,56	62,60	25,80
fr21 Champagne-Ardenne	2,83	1,71	-3,20	66,90	52,40
fr3 Nord - Pas-de-Calais	4,75	1,75	-3,72	62,20	322,30
fr43 Franche-Comté	3,40	1,71	-1,25	69,10	69,00
fr63 Limousin	-3,66	1,77	3,94	67,10	42,00
it92 Basilicata	0,16	1,68	-1,48	52,80	60,70
itb Sardegna	-0,36	1,57	-0,42	56,50	68,60
pt14 Alentejo	-5,90	1,76	8,38	na	24,40
pt2 Açores (PT)	3,33	1,78	-13,73	62,40	103,20
se06 Norra Mellansverige	-3,81	1,77	0,48	75,40	13,10
se07 Mellersta Norrland	-3,93	1,76	-0,79	74,10	5,40
se08 Övre Norrland	-1,74	1,72	-1,55	71,70	3,30
se09 Småland med öarna	-2,25	1,79	0,00	77,80	24,10
bg01 Severozapaden	-9,66	1,75	2,03	**57,60**	55,60
bg02 Severen Tsentralen	-7,55	1,67	2,76	**59,90**	68,70
bg03 Severoiztochen	-3,56	1,63	0,15	**60,10**	67,50
bg06 Yugoiztochen	-2,66	1,66	-0,36	**58,10**	56,50
ee004 Lääne-Eesti	-2,99	1,75	100,00	na	**14,90**
ee006 Kesk-Eesti	-9,66	1,77	2,76	na	**15,90**
ee007 Kirde-Eesti	-3,31	1,66	-2,21	na	**53,40**
ee008 Lõuna-Eesti	-3,66	1,78	0,85	na	**22,40**
hu04 Dél-Dunántúl	-5,32	1,63	3,07	57,60	**68,60**
lt008 Telsiu (Apskritis)	0,55	1,77	-1,64	na	**43,40**
lv002 Vidzeme	-4,68	1,75	-6,34	na	**na**
lv003 Kurzeme	-4,23	1,71	-25,98	na	**23,60**
lv004 Zemgale	-3,41	1,71	-13,64	na	**na**
lv005 Latgale	-7,99	1,70	-2,32	na	**26,40**
pl0a Podlaskie	0,00	1,76	-1,55	67,40	**60,60**

The first sample of "Shrinking" communities – NB! based on incomplete data - provides a shortlist, which will be extended and elaborated in the Final Report. The shortlist points out one Shrinking region in Denmark, Hungary, Lithuania and Poland, two in Italy and Portugal, three in Spain and Greece, and four in France, Bulgaria, Sweden, Estonia and Latvia. The regions experiencing the most complex problems associated with population change are Mellersta Norrland in Sweden, Seveoizapaden and Yugoiztochen in Bulgaria and Kurzeme in Latvia.

Policy implications for "Shrinking" communities

"Shrinking" communities require policy measures designed to make the areas more attractive to net migration and to retain existing citizens. They may be experiencing a loss of the active age labour force due to loss of jobs and the lure of higher paying employment in close by major cities. The types of policy interventions needed here are not only those focused on Structural funding in Objective 1 regions, but also regional and local measures to find a distinct role for economic activity in the areas and to avoid the risk of becoming of "bedroom" communities. In the shrinking communities, bottom-up processes of governance are needed to endow these regions with not only the capacity to start the process of change themselves, but also to capitalise on already existing knowledge of the spatial economic and social structures. This may entail an infusion of efforts based on innovation and knowledge sectors.

4.2.3.3 Typo 3: EU's 'Rustic' communities:

Ceteris paribus, regions specializing in the primary sector, with low income levels and a slow rate of structural transformation in the recent past, but now moving towards secondary and tertiary sectors are more likely to experience poor economic growth rate in the near future than other agriculture-dominated regions. We assume that current low income and technology levels in agriculture will not attract investments in agriculture in these communities as much as in other more high technological agricultural regions We also assume that the slow rate of transformation from the agrarian economy in the past reflects the fact that the manufacturing and service sectors did not find these regions attractive as economic locations in the pre-accession situation, when international competitions was less fierce than after enlargement.

The EU's 'Rustic' communities are scoped by looking at the regional industrial structure with focus on the primary sector. In addition, productivity is indicated for the total regional economy but also for the primary sector. In the latter case the size of agricultural land per person employed in primary sector is measured. Here it is assumed that fewer workers are needed to exploit a square kilometre of agricultural land as the primary sector becomes more competitive. Unfortunately using agricultural employment instead of primary sector employment was not possible due to data gaps. Hence regions with a high share of employment in fishery or forestry tend to turn out being less competitive in this regard. Table 4-6 shows the complete set of indicators. Generally low indicator values make a region more 'Rustic'. However, a low share and/or a decrease in primary sector employment, indicates "Rustic" characteristics

Table 4-6: Indicators for Typo 3

I31	Primary sector employment, share	1996
I32	Change in primary sector employment (p.a.)	1991-1996
I33	GDP (PPS) per person employed	1996
I34	Agricultural land (km^2) per person employed in primary sector	1990
I35	Tertiary sector employment, share	1996

Map 4-7 shows EU's 'Rustic' communities on a map. There are six regions with all indicator values in the lowest quartile. These extreme 'Rustic' communities are all together located in Romania. The very rustic communities having four indicator values in the lowest quartile can be primarily found in Romania as well as in Bulgaria, Latvia, Lithuania, the Czech Republic, Slovenia and Slovakia but even in Portugal, Italy and Greece. Table 4-7 lists the characteristics of the EU's 63 very and extreme 'Rustic' regions.

Map 4-7: EU's 'Rustic' communities

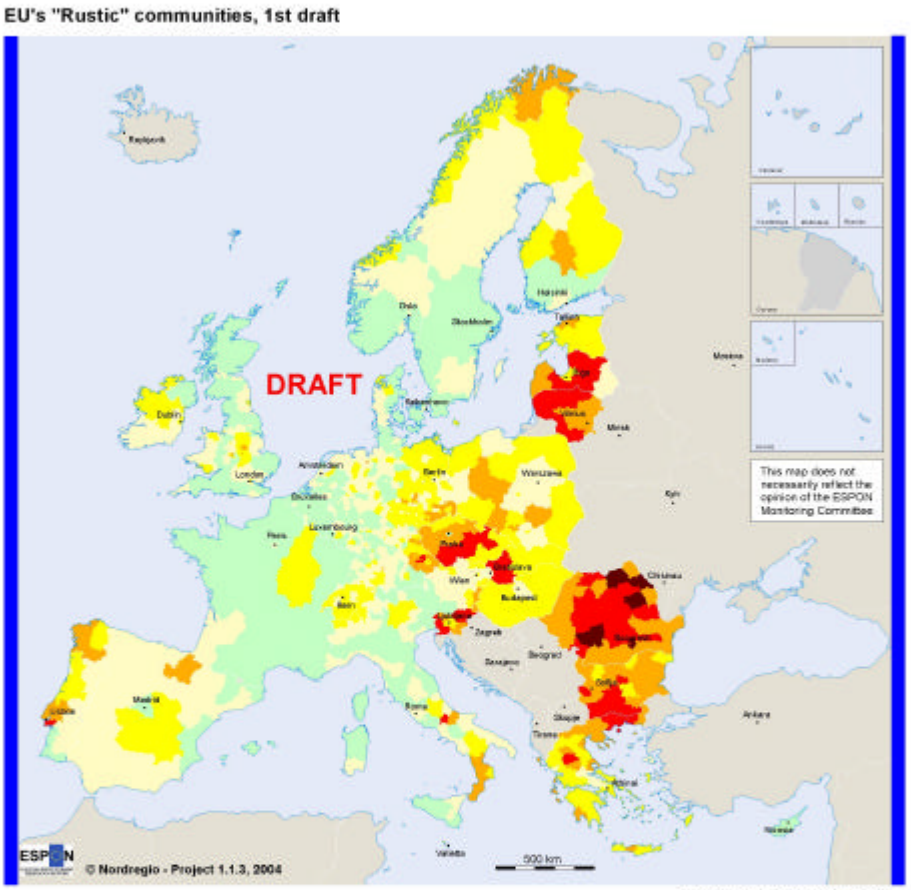


Table 4-7: The EU's extreme 'Rustic' communities and their characteristics (Q1=indicator value in highest quartile, Q4=indicator value in lowest quartile)

NUTS_3	Region	I31	I32	I33	I34	I35
BG024	GABROVO	Q4	Q1	Q4	Q4	Q4
BG043	BLAGOEVGRAD	Q4	Q1	Q4	Q4	Q4
BG044	PERNIK	Q4	Q1	Q4	Q4	Q4
BG051	PLOVDIV	Q4	Q1	Q4	Q4	Q4
BG054	PAZARDZHIK	Q4	Q1	Q4	Q4	Q4
BG055	SMOLYAN	Q4	Q1	Q4	Q4	Q4
BG056	KARDZHALI	Q4	Q1	Q4	Q4	Q4
CZ031	BUDEJOVICKY	Q4	Q4	Q4	Q2	Q4
CZ053	PARDUBICKY	Q4	Q4	Q4	Q2	Q4
CZ061	JIHLAVSKY	Q4	Q4	Q4	Q2	Q4
CZ071	OLOMOUCKÝ	Q4	Q4	Q4	Q3	Q4
DE221	LANDSHUT, KRFR.ST.	Q4	Q4	Q1	Q4	Q4
DE22B	STRAUBING-BOGEN	Q4	Q4	Q4	Q1	Q4
GR112	XANTHI	Q4	Q1	Q4	Q4	Q4
GR113	RODOPI	Q4	Q1	Q4	Q4	Q4
GR114	DRAMA	Q4	Q1	Q4	Q4	Q4
GR115	KAVALA	Q4	Q1	Q4	Q4	Q4
GR144	TRIKALA	Q4	Q1	Q4	Q4	Q4
IT721	ISERNIA	Q4	Q4	Q2	Q4	Q4
LT001	ALYTAUS (APSKRITIS)	Q4	Q4	Q4	Q2	Q4
LT003	KLAIPEDOS (APSKRITIS)	Q4	Q4	Q4	Q2	Q4
LT004	MARIJAMPOLES (APSKRITIS)	Q4	Q4	Q4	Q1	Q4
LT005	PANEVEZIO (APSKRITIS)	Q4	Q4	Q4	Q1	Q4
LT006	SIAULIU (APSKRITIS)	Q4	Q4	Q4	Q2	Q4
LT007	TAURAGES (APSKRITIS)	Q4	Q4	Q4	Q1	Q4
LT008	TELSIU (APSKRITIS)	Q4	Q4	Q4	Q2	Q4
LV002	VIDZEME	Q4	Q4	Q4	Q1	Q4
LV004	ZEMGALE	Q4	Q4	Q4	Q1	Q4
PT133	PENINSULA DE SETUBAL	Q4	Q4	Q4	Q4	Q1
RO014	NEAMT	Q4	Q3	Q4	Q4	Q4
RO024	GALATI	Q4	Q3	Q4	Q4	Q4
RO026	VRANCEA	Q4	Q3	Q4	Q4	Q4
RO031	ARGES	Q4	Q3	Q4	Q4	Q4
RO033	DAMBOVITA	Q4	Q3	Q4	Q4	Q4
RO035	IALOMITA	Q4	Q4	Q4	Q3	Q4
RO036	PRAHOVA	Q4	Q3	Q4	Q4	Q4
RO043	MEHEDINTI	Q4	Q4	Q4	Q3	Q4
RO053	HUNEDOARA	Q4	Q3	Q4	Q4	Q4
RO063	CLUJ	Q4	Q3	Q4	Q4	Q4
RO064	MARAMURES	Q4	Q3	Q4	Q4	Q4
RO071	ALBA	Q4	Q3	Q4	Q4	Q4
RO072	BRASOV	Q4	Q3	Q4	Q4	Q4
RO073	COVASNA	Q4	Q3	Q4	Q4	Q4
RO074	HARGHITA	Q4	Q3	Q4	Q4	Q4
RO075	MURES	Q4	Q3	Q4	Q4	Q4
RO076	SIBIU	Q4	Q3	Q4	Q4	Q4
RO081	BUCURESTI	Q4	Q3	Q4	Q4	Q4
SI002	PODRAVSKA	Q4	Q3	Q4	Q4	Q4
SI003	KOROSKA	Q4	Q3	Q4	Q4	Q4
SI004	SAVINJSKA	Q4	Q3	Q4	Q4	Q4
SI005	ZASAVSKA	Q4	Q3	Q4	Q4	Q4
SI00A	NOTRANJSKO-KRASKA	Q4	Q3	Q4	Q4	Q4
SI00B	GORISKA	Q4	Q3	Q4	Q4	Q4
SI00C	OBALNO-KRASKA	Q4	Q3	Q4	Q4	Q4
SK021	TRNAVSKÝ KRAJ	Q4	Q4	Q4	Q3	Q4
SK022	TRENCIANSKÝ KRAJ	Q4	Q4	Q4	Q3	Q4
SK023	NITRIANSKÝ KRAJ	Q4	Q4	Q4	Q2	Q4
RO011	BACAU	Q4	Q4	Q4	Q4	Q4
RO013	IASI	Q4	Q4	Q4	Q4	Q4
RO015	SUCEAVA	Q4	Q4	Q4	Q4	Q4
RO042	GORJ	Q4	Q4	Q4	Q4	Q4
RO045	VALCEA	Q4	Q4	Q4	Q4	Q4
RO082	ILFOV	Q4	Q4	Q4	Q4	Q4

Policy implications for "Rustic" communities

The extreme types of rustic communities tend to largely be located in the accession countries and new Member States. They may tend to be heavily agricultural areas, although from the data this is only speculation, yet they are experiencing a decline in other tertiary sectors such as fishing of forestry. The key type of policy intervention needed here may be those that give revitalise the growth process, but do so in a sustainable manner so as not to drastically break down the resource base on which the sectors are founded. Achieving economic cohesion in these communities will be primarily an EU and national priority and coherent integration of sectoral policies (such as CAP funding, environmental policy and national resource laws) may be of importance. These communities may stand to benefit most greatly from increased accessibility and measures to boost polycentrism at the national level as it would enable them to more easily bring goods to major economic centers.

Rural Development Policy should focuson the enormous needs in EU's *Rustic communities.* EU's RDP should be broadened to focus more on *sustainable rural development* and suggest possibilities to support funding the often risk-filled attempts to switch to more environmentally-friendly methods of agricultural production. The RDR budget in old and new member states should be adjusted to the particular needs for rural development and environmental management.

4.2.3.4 Typo 4: EU's Rust-belt:

Ceteris paribus, regions specializing in manufacturing industries, with low income levels and slow growth rates of the regional growth in the recent past are more likely to experience poor economic growth rates in the near future than in other manufacturing regions. We assume that current low income and technology levels in the manufacturing industry will not attract new industrial investments as much as in other manufacturing regions We also assume that the slow growth rates in the recent past reflect the fact that the manufacturing and service sectors did not find these regions attractive as economic locations in the pre-accession situation, when international competition was less fierce than after enlargement.

The EU's Rust-belt is scoped by looking at the regional industrial structure with focus on the secondary sector. Furthermore the development in economic performance and unemployment complete the set of indicators, as shown in Table 4-8. Generally low indicator values indicate Rust-belt characteristics except for secondary sector employment, where a high share and/or and increase in employment indicates those characteristics.

Table 4-8: Indicators for Typo 4

I41	Secondary sector employment, share	1996
I42	Change in secondary sector employment (p.a.)	1991-1996
I43	GDP (PPS) per capita, relative change to EU15 average	1995-2000
I44	Unemployment rate	2000
I45	Tertiary sector employment, share	1996

Further Research and Tentative Policy Implications

In summary, these elementary typologies aim at a preliminary assessment of where and to which extent there appear risks for a monocentric development or potential for polycentric development at different levels. The typology should give indications of the differential needs for coordinated policy intervention at EU, national and regional level.

In the next step – to be pursued in the final year of our project - we introduce qualitative information, describing *unique* features for regions within each typology, namely

- Cultural aspects, e g language barriers and commonalities
- Location of specialized functions
- Indicators of administrative capacity
- Existing or Planned Cooperation strategies between region
- Natural heritage
- Industrial structure and change

From the qualified typology, we will – in the Final Report - address more in detail policy orientation to all three territorial levels. At the EU level, we recognize that the Commission has identified themes and territorial priorities where, it argues, the EU has a justifiable role: industrial areas undergoing conversion; urban areas in difficulty; areas facing specific geographical or demographic handicaps; cross-border, transnational and interregional co-operation; social inclusion; equality of opportunity; and the new economy and knowledge society.

We also recognize that the Commission has adopted a proposal of five new regulations for renewed Structural Funds and instruments. Over the period 2007-2013, these instruments present about one third of the EU budget. The majority of this amount will be spent in less-developed Member States and regions. However, within these geogrphical limits, we assess that there is a clear need to target support even to the most problematic regions, such as the ones we have detected in this typology.

The new general regulation defines common principles, rules and standards for the implementation of the ERDF, the ESF and the Cohesion Fund. In combinations, funding ideally priorities include research, innovation, environmental issues and risk prevention, Infrastructure retains an important role, especially in the least developed regions. ESF funds aims to achieve progress towards full employment, to improve quality and productivity at work, and to promote social inclusion and cohesion. The Cohesion fund contributes in the field of the environment and trans-European networks. European grouping of cross-border co-operation aims to overcome existing obstacles hindering cross-border co-operation.

However, we cannot expect that the new programme, largely based on previous policies applied in EU15, will be able to meet *the enormous and differential needs* coming from least favoured enlargement regions. There is a strong demand for innovative policy and policy innovations at all levels. This leads to our recommendation for policy combinations in the course of enlargement: Allow for more experimental or ad hoc approaches to policy design and implementation. In implementation, feed-back processes and process evaluation at all levels have to be built-in to achieve a continuously adaptive and learning system for reaching a more polycentric, sustainable and cohesive Europe.

4.3 Needs in Border Regions

Gabriela Tatzberger, Friedrich Schindegger[2]

Cross-border cooperation remains one of the most crucial tools for achieving the goal of economic and social cohesion, particularly with regard to the border regions of the EU15/EU10, the EU10/EU10 and the EU10/new neighbours. As seen in the diagram below from Chapter 3.1, the performance of border regions in general, but in particular of the accession countries, tends to be lower than the EU average. This chapter examines some of the existing barriers and opportunities of to border regions of the accession countries for economic and social integration.

Yet the physical, economic and ethnic composition of border regions in the New Member States varies widely across the territory and thus also the needs and preconditions for social and economic integration into the EU.

[2] ÖIR, Vienna and Iván Illés, Centre for Regional Studies – Hungarian Academy of Sciences, Budapest.For data sources please see 1.1.3 SIR, chapter 3.

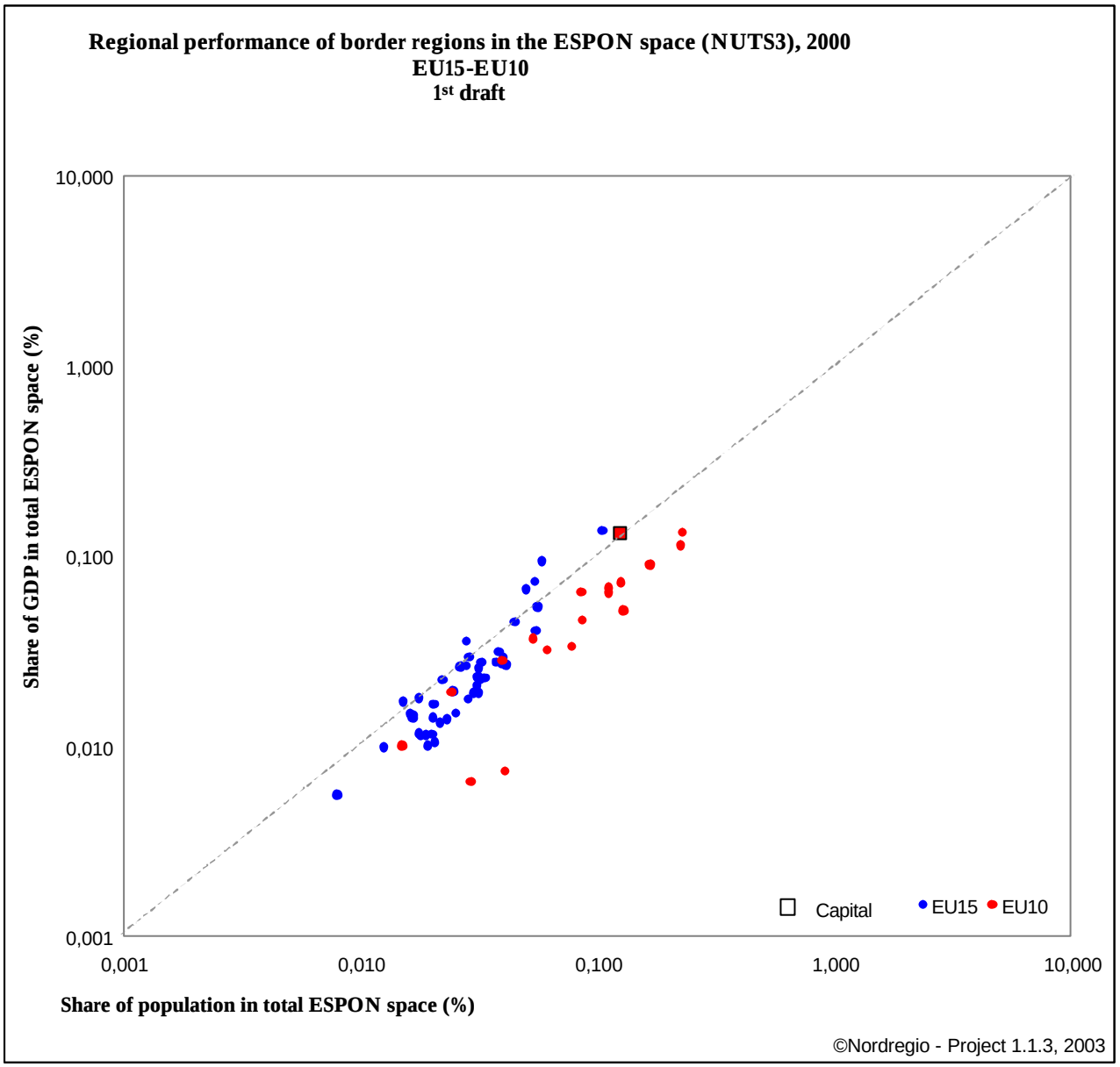


Figure 4-10: Regional performance of border regions in the ESPON space (NUTS3), 2000 EU15-EU10

In this chapter, different components of border characteristics in the border regions of the EU enlargement area are dealt in more detail, by analysing the geographic type of borders, ethnic-historical types of borders, density of border crossings, economic disparities and the membership in Euroregions and transnational Working Communities. Building on the work done in the SIR, these are the basic components for elaborating first draft typologies for "border typology for integration potential" trying to identify on NUTS III level forerunners, hardworkers, candidates of integration and handicapped for integration. We point out the need for directed policies and combinations of policies to increase the performance of EU-10 border regions by increasing cross-border flows of people, goods, services and knowledge. As

a complement to the chapter, which is focused on simple quantitative measures of barriers and opportunities, we outline a proposal for case studies in order to examine the dynamics, opportunities, barriers and needs of border regions in more qualitative detail.

4.3.1 Components in Border characteristics

118 NUTS3 level border regions have been identified in the EU enlargement area (including Romania and Bulgaria, but not including Cyprus and Malta.[3] In the framework of this analysis five types of classification have been prepared for these border regions.

- according to the number of neighbouring countries;
- according to the geographical type of borders;
- according to the ethnic-historical type of borders;
- according to the density of border crossings;
- according to the membership in Euroregions and transnational Working Committees.

Table 4-9: The number of neighbouring countries

	Number of	number of neighbouring countries			
	border regions	1 country	2countries	3 countries	sea only
BG	18	12	5		1
CZ	11	7	4		
EE	5	3	1		1
HU	14	9	4	1	
LT	9	5	4		
LV	5	2	1	1	1
PL	19	11	4		4
RO	19	14	5		
SI	10	5	4	1	
SK	8	3	4	1	
Total	118	76	36	4	7

Out of the 118 border regions, 76 have one country as its cross-border neighbour, 36 have two neighbouring countries and four regions have 3 foreign neighbours. It is worth mentioning these last four regions: Szabolcs-Szatmár-Bereg county in Hungary (neighbours are Slovakia, Ukraine and Romania), Trnavsky kraj in Slovakia (neighbours are the Czech Republic, Austria and Hungary), Pomurska region in Slovenia (neighbours are Austria, Hungary and Croatia) and Latgale in Latvia (neighbours are Lithuania, Belarus and Russia). There are seven border regions that have only sea (maritime) external borders – six around the Baltic Sea and one at the Black Sea, but these are also important cooperation areas.

[3] 120 border regions were listed in the register prepared in the framework of ESPON 1.1.3. project. One of them, Osrednjeslovenska, in Slovenia, as a result in the change of administrative borders in 2000 is not a border region any more. The other region, Centralny Šlaskie, in Poland is not a border region, though its boundaries are very close to the state border.

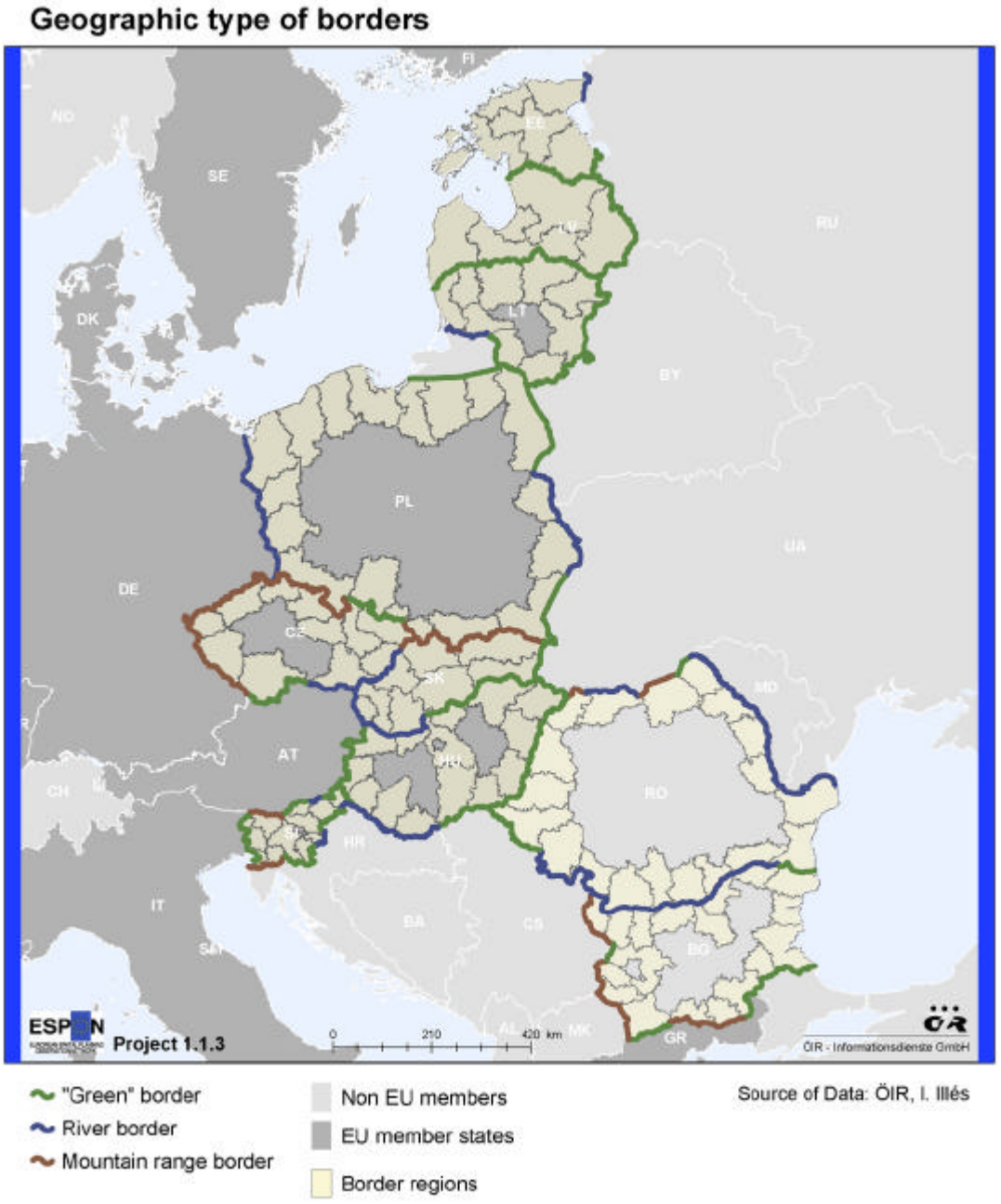
In the whole of Europe, there are 5 border regions that have 3 foreign countries as their neighbours and 4 of these 5 are in the enlargement area (the fifth one is in the extreme north of Finland).

4.3.1.1 The geographical types of borders

Three types of geographic borders have been distinguished on Map 4-8:

- river borders where the border is constituted by a river of substantial breadth and rate of flow (and possibly, but not necessarily navigable);
- mountain borders constituted by a mountain range of more than 1000m height;
- borders with no natural barriers of crossing (called “green” borders, after the colouring of maps at such places).

Map 4-8: Geographic types of borders



Border sections are in many cases not homogeneous. In such cases, they are classified according to the dominant type of geomorphology. Borders with two or more countries are classified as combined types:

Table 4-10: The geographical types of borders

	Border with one country			Border with one country +sea				Borders with two or more countries						total
	river	mountain	green	sea only	sea+ river	sea+ mountain	sea+ green	2 river	2mountain	2green	river+ mountain	river+ green	mount+ green	
BG	5	3	2	1			2		1	1	2		1	18
CZ		5	2					1	1				2	11
EE			1	1	1		1			1				5
HU	4		5							3		2		14
LT	1		4		1					3				9
LV				1			3			1				5
PL	4	1	4	4	1		1		1	1	1		1	19
RO	9	1	2		1		1	1		1	1	1	1	19
SI	1	1	3			1			1			2	1	10
SK	2		1					2	1	1			1	8
Total	26	11	24	7	4	1	8	4	5	12	4	5	7	118

By breaking down border sections with two or more countries we have altogether 168 regional border sections. 68 of them (40 percent) are “green” borders, 47 (28 percent) are river borders, 33 (20 percent) are mountain range borders, and 20 (12 percent) are sea borders. The new internal and the new external borders of the EU according to geographic types is significantly different.

Table 4-11: Types of border sections at internal and external borders

	Distribution of border sections according to geographical types of borders in km			
	“green” border	River border	Mountain border	Total
New internal borders in the enlargement area (2004.05.01)	3885 (48%)	1253 (15%)	2892 (37%)	8030 (100%)
New external borders (2004.05.01)	3023 (69%)	1215 (28%)	140 (3%)	4378 (100%)

While 48 percent of the new internal borders are “green” borders, without significant geographical barriers, the respective percentage at the new external borders is 69 percent. But the most significant difference can be found in the case of mountain borders. 37 percent of the new borders are constituted by mountain ranges; the respective percentage in the case of external borders is only 3 percent. This means that overcoming the internal barriers in terms of new transport connections would be a rather expensive enterprise, while controlling the open external borders also will be an expensive undertaking.

4.3.1.2 The ethnic-historical types of borders

Three ethnic-historical types of borders were distinguished (please see Map 4-9):

- border regions, where the ethnic groups on the two sides of the border are different, they speak different languages, but have lived side by side for centuries and relatively good relations have developed between them;
- border regions where the ethnic composition of the population changed substantially during the twentieth century. Border regions are classified to belong to this group if the majority ethnic group changed in the region during the 20th century.
- border regions where the majority ethnic group on the two sides of the border is the same. This category was the most difficult to identify. In some countries, there are no statistics about the ethnic composition of the regions. The other difficulty is the definition of border regions. In several countries, NUTS3 regions comprise large areas, far beyond the proper border zones. In some countries it is a deliberate intention to define and delineate administrative regions in a way that in none of them should the ethnic minority constitute the majority.

Map 4-9: Ethnic-historical types of borders regions

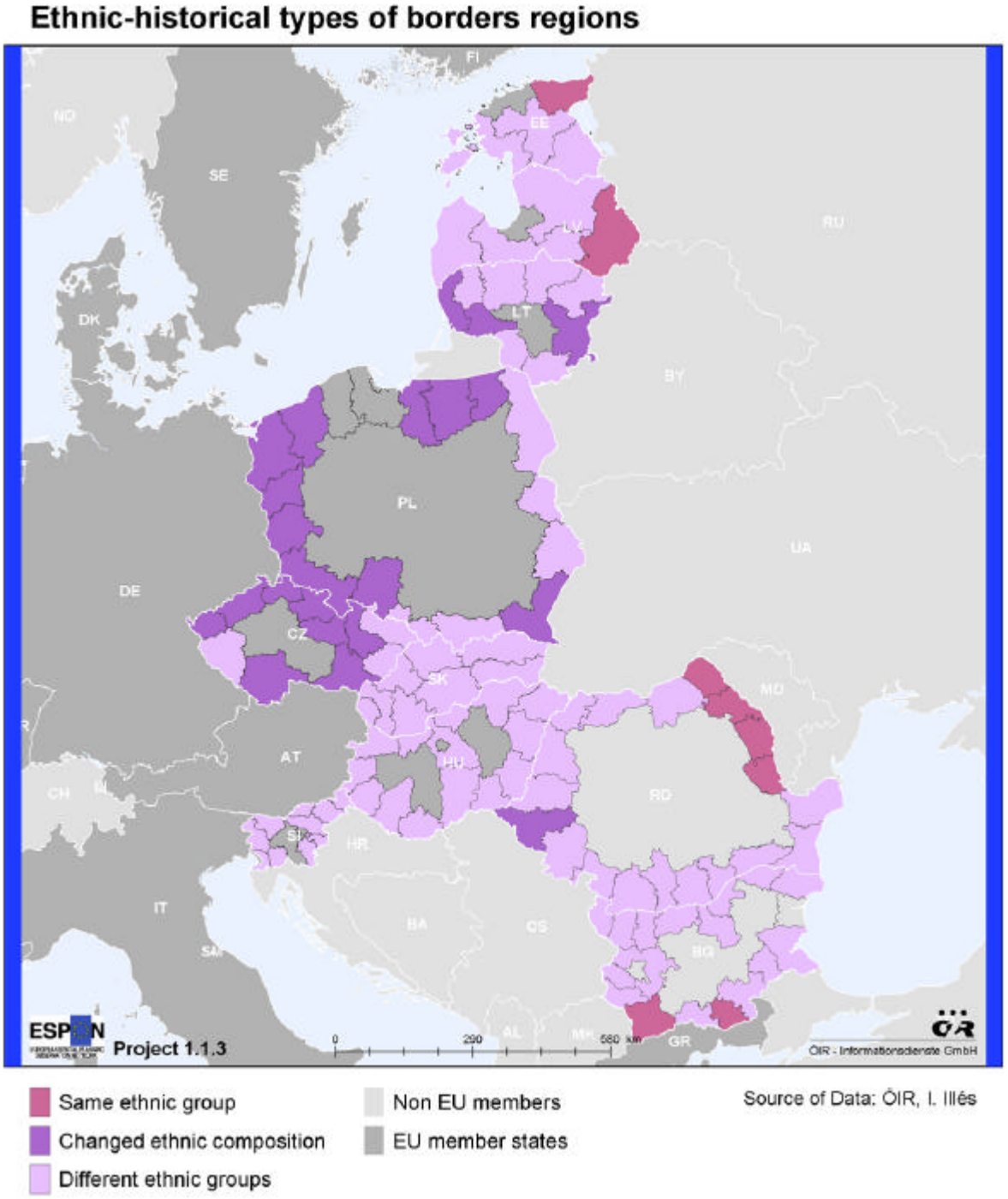


Table 4-12: The ethnic-historical type of borders

	Number of border regions.	Different ethnic groups	Same ethnic group on both sides of the border	Ethnic composition changed substantially
BG	18	16	2	
CZ	11	3		8
EE	5	4	1	
HU	14	19		
LT	9	6		3
LV	5	3	1	1
PL	19	7		13
RO	19	19	4	1
SI	10	12		
SK	8	10		
Total	118	95	8	26

In 84 (70 percent) of the 118 border regions, borders are dividing different ethnic groups that have lived there for centuries. In 26 (22 percent) of the border regions, the ethnic composition changed substantially during the 20th century. These are mostly the Polish, Czech and Lithuanian border regions, where the composition changed at the end of World War II, through massive forced migration. 24 of the 26 regions can be found in these three countries. In the other two regions, Riga in Latvia (now the majority is Russian) and Timis in Romania (Banat) the majority group changed through a slow immigration and emigration process, lasting for several decades during the second half of the 20th century.

There are only 8 regions in the whole enlargement area where the majority ethnic group is the same on both sides of the border at NUTS3 level. Four of them are on the Romanian-Moldovan border, where Romanians live on both sides of the borders. Two are in Bulgaria where the majority ethnic groups are Turks on the Greek-Bulgarian (Kardjali) and Macedonians on the Macedonian-Bulgarian (Blagoevgrad) border. Russians are the majority group in Kirde-Eesti and in Latgale on both sides of the Estonian – Russian and Latvian-Russian border, respectively. Finally, if we look at the NUTS4 level, than there are 5 Hungarian counties where the majority group (Hungarians) is the same on both sides of the borders, and there are 2 Slovenian regions, where the ethnic majority group in the adjacent Italian territories is the same.

4.3.1.3 The density of border crossings

Measuring the density of border crossings in a regional breakdown is a rather biased undertaking. Regional boundaries are usually short and the distribution of border crossings is rather uneven and irregular. Low crossing density in a region with a short border section is not a serious problem if there are enough crossing-points in the immediately adjacent areas. In analysing the following data, these circumstances must be taken into account.

Border-crossings are defined in this analysis as international road border crossings, permanently crossable and for citizens of every nation. Border crossings, crossable only for citizens of the two neighbouring countries and open only on certain days, or for some hours are not considered. The regional breakdown of the length of border is result of estimation, because official data on every country are not available. The indicator is: border-crossing points per 100 km of border. The reason for choosing this indicator and not the reciprocal one (border length per crossing) is that there are several regions where no crossing exists and dividing by zero is an undefined mathematical operation. See Map 4-10.

Map 4-10: Density of border crossing points

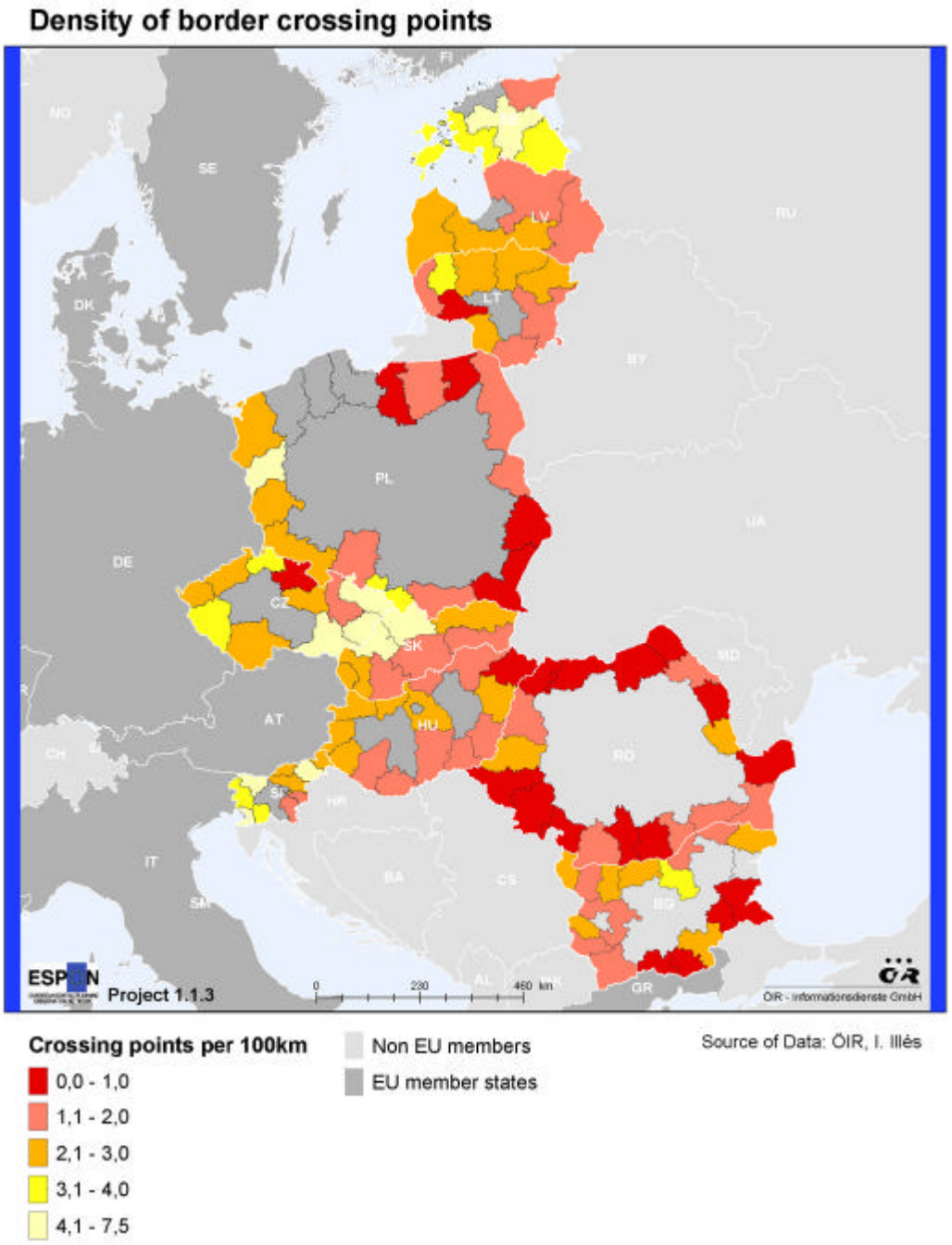


Table 4-13: Density of border crossings

	International road border crossing per 100 km of border length						More than 5
	Number of border regions	No internat. crossing	0-1	1,0-2,0	2,0-3,0	3,0-5.0	
BG	17	3	2	5	6	1	0
CZ	11	0	1	1	4	4	1
EE	4	0	0	1	0	2	1
HU	14	0	1	7	6	0	0
LT	9	1	0	3	4	1	0
LV	4	0	0	1	3	0	0
PL	15	2	2	5	3	3	0
RO	19	3	8	6	2	0	0
SI	10	0	0	2	2	3	3
SK	8	0	0	3	3	2	0
Total	111	9	14	34	33	16	5

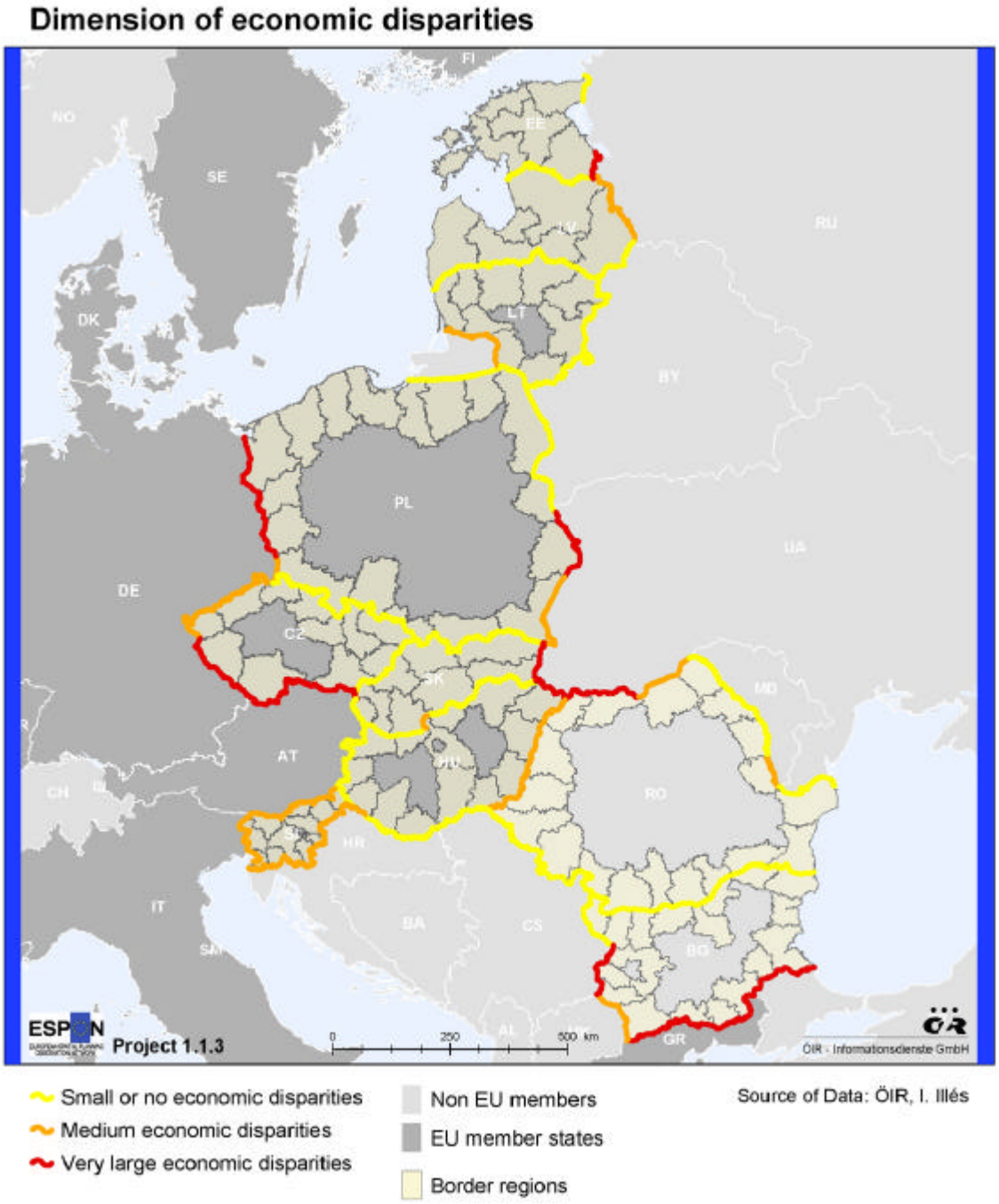
Even now, there are 9 NUTS3 regions in the enlargement area where there are no international border crossings: 3 in Bulgaria and Romania repsectively, 2 in Poland and 1 in Lithuania. The highest density of border crossings can be found – despite the unfavourable geographic conditions – in Slovenia. The lowest density of border-crossings are in Romania and Bulgaria.

4.3.1.4 Economic disparities

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[4].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. See Map 4-11 for the dimensions of economic disparities.

[4] Based on regional GDP data of EUROSTAT

Map 4-11: Dimension of economic disparities



4.3.1.5 Membership in Euroregions and transnational Working Committees

There are 118 border regions and 63 regional cross-border cooperation organisations (60 Euroregions and 3 transnational Working Committees) in the enlargement area. Euroregions are a type of bottom-up structure built by cross-border regions and offer a favourable organisational framework for project preparation, but perhaps their main significance it that establishing a Euroregion signals the intention to engage in cooperation. In the enlargement area the "density" of this type of organisations is even higher than in the Western part of Europe. Unfortunately, the actual progress in cross-border developments and cooperation is not always keeping pace with the development of the organisational framework. (Actually, there are Euroregions on some border sections where there is no international border crossing point in the region). The membership in the organisations is shown on the following table:

Table 4-14: Membership in transnational co-operation schemes

		Euroregions in the enlargement area						
	Number of	Membership in Euroregions				Membership in Working Committees		
	border	at least a part of the NUTS3 region is member in						
	regions	no	1	2	3	no	1	2
		Euroregions in the enlargement area						
BG	18	5	11	2	0	11	7	0
CZ	11	0	5	5	1	11	0	0
EE	5	0	3	2	0	5	0	0
HU	14	2	5	6	1	3	9	2
LT	9	1	7	1	0	9	0	0
LV	5	1	1	3	0	5	0	0
PL	19	0	16	3	0	18	1	0
RO	19	2	14	3	0	5	14	0
SI	10	0	10	0	0	0	10	0
SK	8	0	3	3	2	3	5	0
Total	118	11	75	28	4	70	46	2

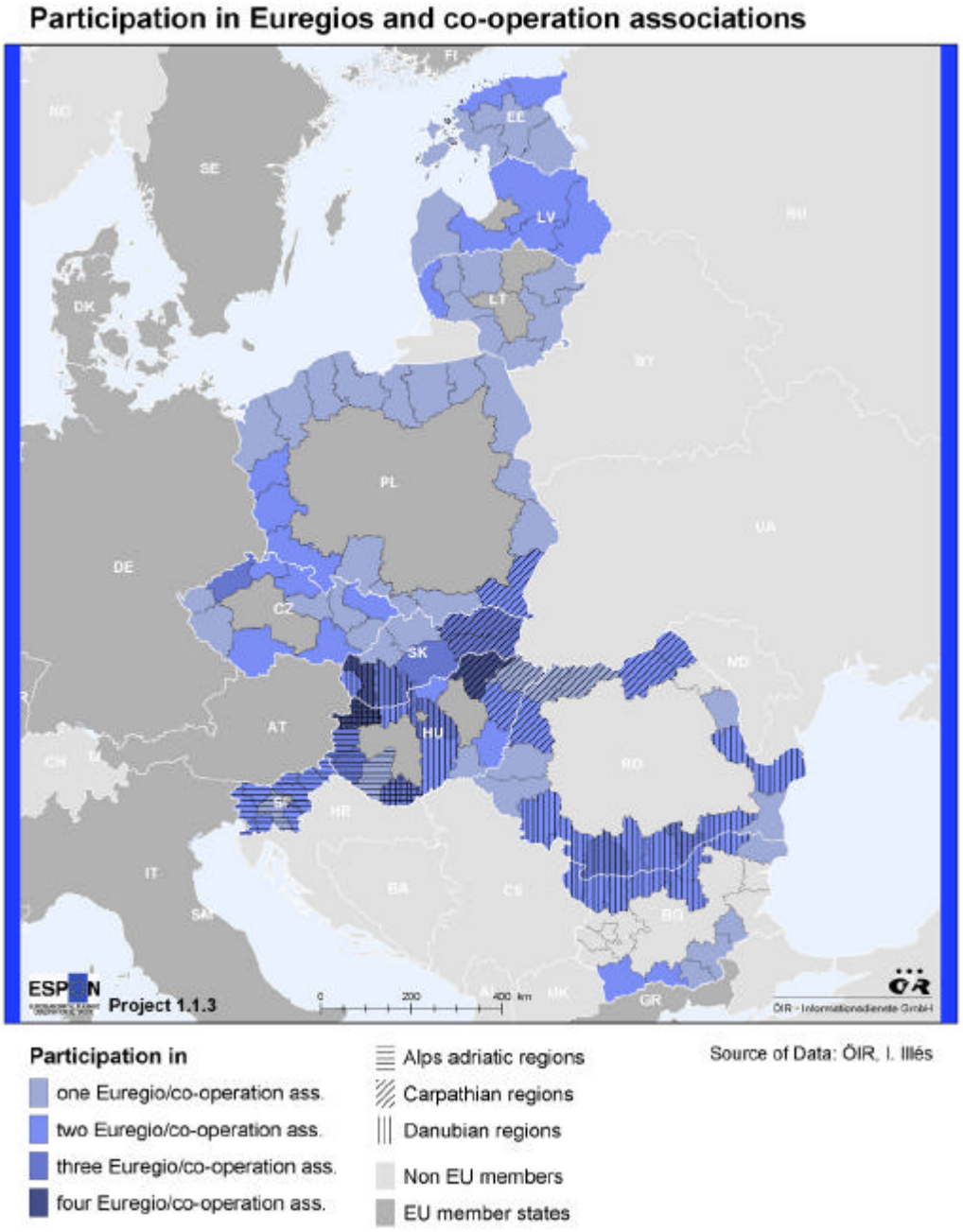
More than 90 percent of the border regions are members of one or more of these organisations (on the Table in Annex 4.1 the figure in parentheses refers to the serial number of the cross-border cooperation organisation in Annex 4.2). In the Czech Republic, Estonia, Poland, Slovakia and Slovenia, actually all border regions are members of one or more organisation. 28 regions are members in two, 4 regions in three organisations. It means that there are also overlapping Euroregion organisations, especially in the Baltic states and in Southeast Europe.

Working Communities are generally forums of collection, systematisation, dissemination and exchange of information and deal with the more "soft" aspects of regional cross-border cooperation. Membership in Working Communities (Arbeitsgemeinschaften) is less complete. The reason for this is, that there are only 3 such organisations in the Enlargement area, with geographically clearly defined activity areas: the Alps-Adriatic Working Community, the Danubian Regions Working Community and the Carpathian Euroregion. The name of the

letter is though Euroregion, but its size and activities can be clearly defined as Working Community.

Only four border regions are members in 3 Euroregions (Ústecky kraj in the Czech Republic, Borsod-Abaúj-Zemplén county in Hungary and the Banskobytricky and Trnavsky kraj in Slovakia) and only 2 regions are members of two Working Community, both in Hungary (Gyor-Moson-Sopron and Baranya counties).

Map 4-12: Participation in Euregios and co-operation association



4.3.2 Mapping the typologies

In order to present the results in a more comprehensible way they are drawn in maps of the border regions dealt with. First, the features concerning the single criteria mentioned above are shown. Finally, two versions of ´draft border typology for integration potential´ try to summarise the observed characteristics in different ways. This exercise is done without applying the first indicator surveyed, the ´number of neighbouring countries´, because it is not considered crucial for the integration potential. The indicator ´ethnic-historical type of borders´ is not applied in the integrated typology because of its ambiguity.

The rationale for the integrated typology is as follows:

Table 4-15: Dimensions and criteria

Dimensions	**Criteria**	
Starting position	Density of border crossing points	Intensity of transnational activities
Potential change	Geographic type of border	Economic disparities
	… applied in Version 1	… applied in Version 2

Table 4-16 and Table 4-17 show two different approaches (Version 1 and 2) of drafts of integrated types of border regions.

Table 4-16: Version 1: see Map "Draft # 1: border typology for integration potential"

Potential for change / **Starting Position**	**High:** Green border	**Low:** Mountain / River border
Good: High density of border crossing points	**Forerunners of integration**	**Hardworkers of integration**
Bad: Low density of border crossing points	**Candidates of integration**	**Handicapped for integration**

Map 4-13: Draft # border of integration potential

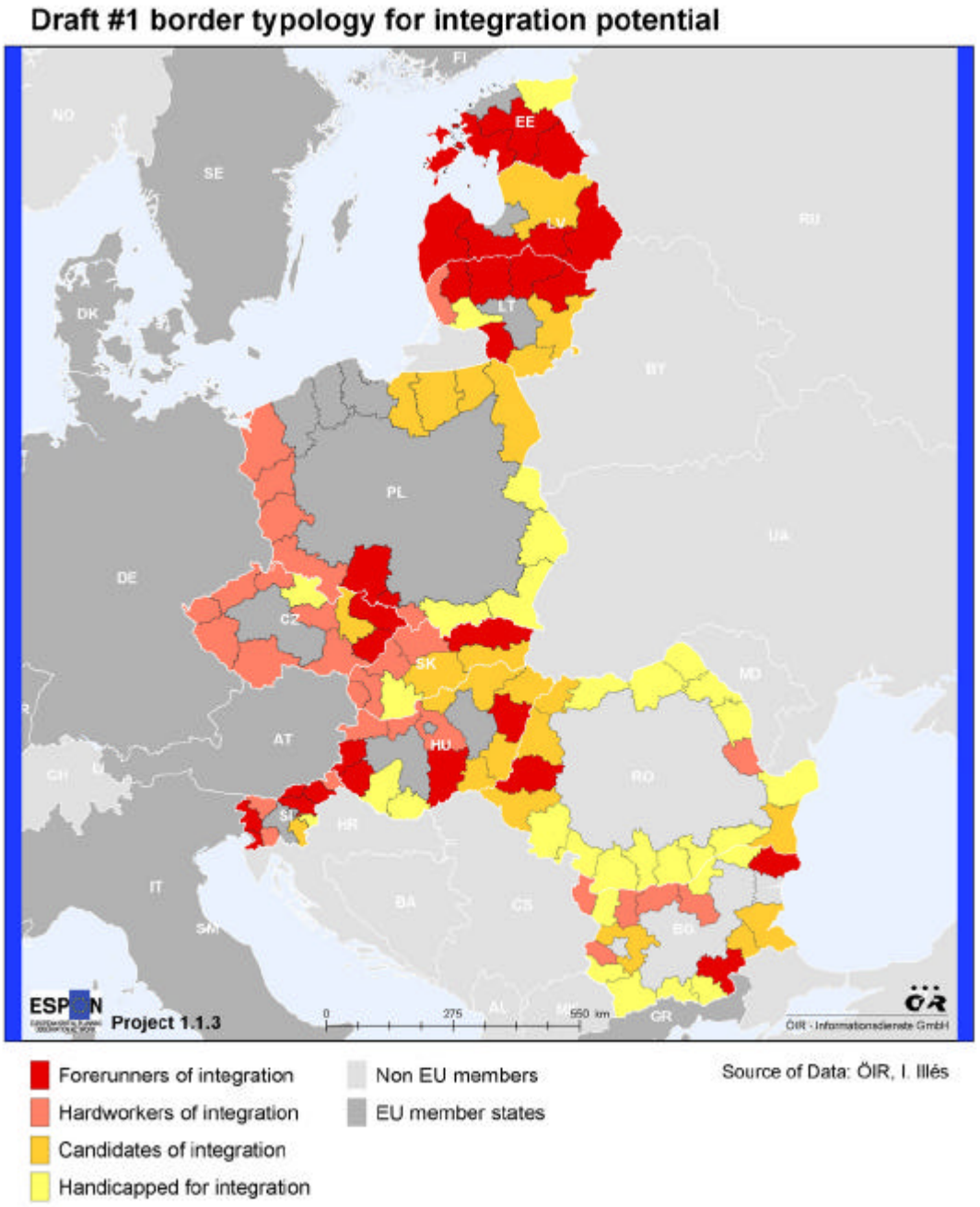
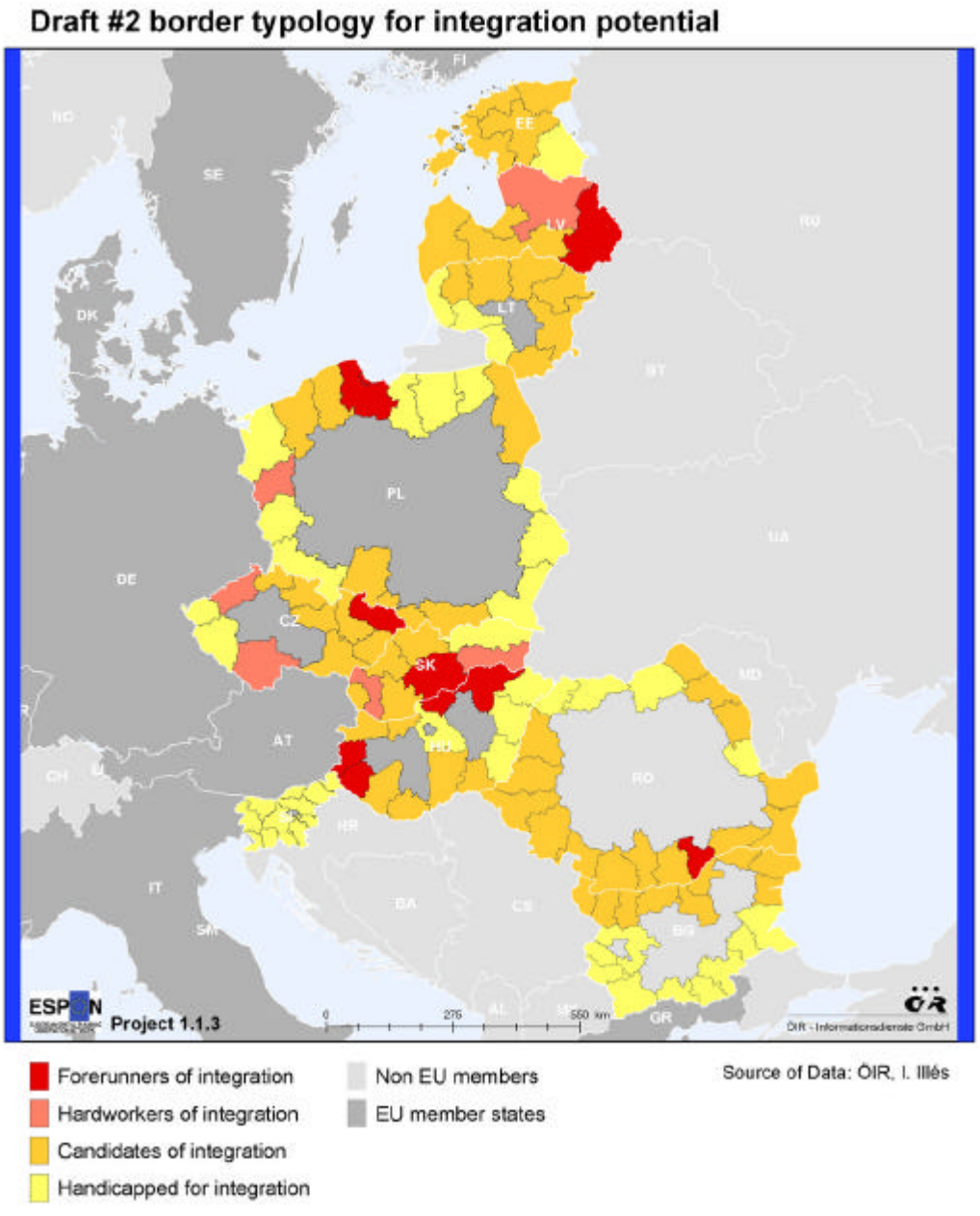


Table 4-17: Version 2: see Map "Draft # 2: border typology for integration potential"

Potential for change / Starting Position	**High:** High economic disparities	**Low:** Low economic disparities
Good: High number of trans-national activities	**Forerunners of integration**	**Hardworkers of integration**
Bad: Low number of trans-national activities	**Candidates of integration**	**Handicapped for integration**

Map 4-14: Draft #2 border typology for integration potential



4.3.3 Policy implications based on Integration potential typologies

In the "Version 1" typology in Map 4-13, which we could call "Flow accessibility", we see that quite naturally border regions that have "green" or easily passable borders with a high density of border crossings are Forerunners candidates of integration (integration here consisting of increased flows of goods, services, knowledge and cross-border cooperation and implicitly economic and social integration). Inter-regional export of goods is expected to be higher and the frequency of travel, for tourism or commuting, is facilitated. Those regions with low density of border crossings and generally less inaccessible borders are at the start Handicapped for integrative processes and flows. Hardworkers and Candidates for integration still have low density of border-crossings and more inaccessible borders to overcome.

In the "Version 2" typology in Map 4-14, which we could call "Capacity flow", we find that border regions with a good potential to change high economic disparities and a large number of transnational activities are Forerunners of integration in terms of flows of cooperation efforts, twinning schemes and/or capacity building measures. The potential for bottom-up efforts at the regional and local levels is significant. Those border regions with a low number of transnational activities and low economic disparities are "Handicapped" in finding suitable reasons and forums for cooperation. Since the level of disparity is low, but the number of transnational activities is high for the Hardworkers of integration, capacity-building projects are of less importance and cooperation schemes may focus on exchange of knowledge, best practices and experiences. The Candidates for integration may have good reason to engage in capacity building, but have not yet found the forums in which to do this.

Thus the Version 1 and Version 2 typologies implies that a range of policy interventions will have to be applied in varying doses and methods if the goal is to increase polycentric development. While it would be tempting to focus EU and national funding on the forerunners of integration border regions for their value-added aspects, this may do little decrease national region disparities. Regional and local policy efforts are needed in drawing to the attention of national and EU policymakers the needs for interventions in the "handicapped" cross-border regions, particularly those dealing with exchange of best practices border-crossing infrastructure.

4.3.4 Case studies of border regions

Elisabeth Vajdovich Visy

Because of the wide variation in border region types and the inability to gain hard data on various types of flows of people, goods, service and knowledge, this study will be enriched by in the Final Report by in-depth case studies of border regions lying along the (former) EU borders, border regions along the border between two new member states, border regions lying at the external EU borders in order to understand qualitatively the unique processes of

integration, the changes of border region position in the national development structure and the vehicles and barriers of integration for these regional types.

Background

Eight of the ten new member countries and two (or three, in case of Croatia) more to join the European Union are former Eastern European socialist countries. (Because of their insular location and small territory the border regions of Cyprus and Malta need not be identified – though the north – south political division of may be of interest to study).

The border regions of the formerly east European socialist countries were directly affected by the political division and now these regions occupy a special position in the development structure of the respective countries. The special characteristics follow from the factors below:

- the border regions were and are directly affected by the political and economic relations with the neighbouring country,
- the majority of the border regions had the opportunity to take part in interreg, cross border programs.,
- the border region of the EU member state lying at the outer border of the EU was and is also affected by this position.

Purpose

The purpose of the case studies is to demonstrate whether border location has effected the development potential of the region. If it has, what are the measurable results or processes, and what potentials (and/or threats) can be identified.

Types

Border regions of the new member states can be classified: as follows:

- border regions lying along the (former) EU borders
- border regions along the border between two new member states
- border regions lying at the external EU borders.

The case studies should be worked out at least for one border region of each type, because they represent differences in terms of development potential.

Structure

In the case studies analysis is proposed of the following:

- characteristics of the border region in the national context
- changes of the characteristics of the region over time (e.g. 1990-2004)

The proposed core indicators:

- population, density

- composition of population change
- in-, out-migration
- commuting
- educational level
- GDP/capita
- Economic structure: employment
- Occupational structure
- Types of industries (old vs new market economies)
- Land-use change
- nature conservation
- environmental quality
- transport infrastructure, flows

Indirect indicators:

- barriers:
  - natural barriers
  - political, historical barriers
  - infrastructure shortages
- links, cooperations:
  - cross-border schemes
  - inter-municipality cooperations
  - joint environmental/nature conservation schemes

By means of these indicators the case study will focus on the following:

- process of integration
- changes of the position of the border region in the national development structure
- vehicles and barriers of integration

5 Scenario Studies - Spatial Effects of the Enlargement of the European Union 2004-2021

In this chapter the methodologies for examining the regional and spatial effects of the enlargement of the European Union on the development of GDP, sectoral structure, trade, investment, employment, population and migration flows on the regions in the new member states, in particular least favoured regions and border regions, are discussed and demonstrated in preliminary examples.

To forecast the effects of enlargement, two scenario studies are conducted in ESPON 1.1.3 using two different but complementary forecasting models of regional socio-economic development:

- The RESSET model used in Scenario Study 1 is a new model which is designed primarily for ESPON 1.1.3. It is a sketch planning model which enables any casual user with a view about the future urban and regional development of the ESPON space to engage in information speculation: to explore the scenario space.

- The SASI model parallelled used in ESPON 2.1.1 is a model of regional socio-economic development particularly designed to show the impacts of European transport policies.

The two models are made as much as possible comparable by using a harmonised spatial database and similar assumptions about the overall economic and demographic development of the enlarged European Union as a whole.

The scenarios to be simulated with the two models will be defined in close co-operation with other ESPON projects, in particular the spatial scenario project ESPON 3.2. In this report preliminary results based on first tests of the models or, in the case of the SASI model applications simultanously reported in ESPON 1.1.3 and 2.1.1. The chapter will close with a perspective on comparing the results of the two models and possible policy conclusions.

5.1 Scenario Study 1

Mike Batty

5.1.1 The RESSET Approach

The scenarios generated by the **RESSET** Model (**RE**gional **S**cenario **S**imulations for the European Territory) are quite different in conception from those produced by **SASI**. **RESSET** is a sketch planning model that enables the user to very quickly test a scenario at different levels of detail by specifying different scales of change in population, employment, and accessibility. Whereas **SASI** is a large scale simulation model which is operated by professional model builders, **RESSET** is a sketch planning tool that is tiny in comparison, being delivered to any user over the net and designed to be run over and over again to generate a sense of the future development of Europe rather than very detailed result at the subregional level. A demo

version of the model is available at http://www.casa.ucl.ac.uk/RESSET.zip[1]. The model will continue to be developed throughout the rest of this project and the description that follows outlines its core and the preliminary pilot. Users are forewarned that the software is rudimentary with error checking not in place although the user friendly interface to this kind of sketch planning is a well established feature of our approach to generating scenarios, thus nicely complementing the **SASI** model in terms of detail and scale.

RESSET simulates change in the European space at three levels: first at the entire EU29 level (EU15+CH+NO+AC12) which involves a demo-economic forecasting model of the 29 countries based on extrapolation of population and employment under various plausible scenarios about aggregate growth rates – fertility and mortality, net migration and economic development. This model is one that forecasts **DE**mographic and e**CO**nomic activity aspatially in Europe with respect to global and regional issues and we refer to this as the **DECO** submodel. The second model which we refer to as the **CORE** of the system is a submodel that is a spatial simulation of growth and change in population and employment at the country level but is informed by accessibilities and relative **CO**untry/**RE**gion level attractions. The third model is a disaggregation of **CORE**, referred to as URAL, which involves simulating an apportionment of **UR**ban and ru**RAL** growth/change from the country level to the NUTS3 regions. This model is also a spatial accessibility-based model but it effectively moderates the forecasts made at the two higher levels by factoring in urban and rural differences as well as the unevenness of national development.

These three models are being closely integrated and they are designed to pick up detail at the three different scales which cannot be handled satisfactorily at any one single scale. Therefore iterations between them are essential to establish equilibrium and consistency between their predictions. In essence, aggregate totals are forecast by **DECO**, and then these totals are distributed to the country level using the aggregate accessibility-style model **CORE**. These country level estimates then form the control totals for the much more detailed model **URAL** which works at the NUTS3 level. This model effectively simulates urban and regional development incorporating many more physical constraints than at the upper levels. However the totals that are generated can be different at these lower levels and this in turn necessitates iteration between the levels In short, although the model system begins at the aggregate **DECO** level, in practice all these levels are of equal importance and this is established through the iterative structure which we show in Figure 5-1.

[1] This can be downloaded in seconds as it is only 280KB. When unzipping, users must ensure that the model ***RESSET.exe*** is in the same folder as the data set ***RESSET-data.csv***.

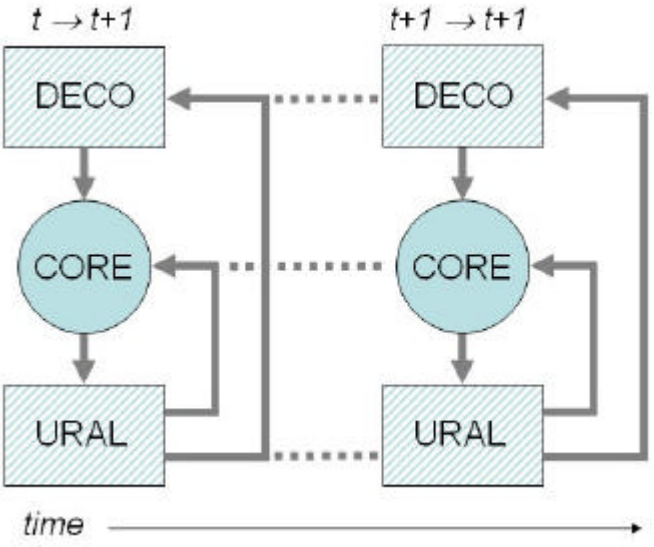


Figure 5-1: The Three Level Model Structure (hatched components yet implemented)

Unlike **SASI** which has been under development for a year or more, this model is entirely new, conceived for ESPON 1.1.3 and has not been presented before. We therefore need to explain its structure and calibration to data in a little more detail than **SASI** so that readers grasp the progress we have made and the work still required in the rest of this project.

5.1.2 Application of the CORE Model

The Structure of the Model

So far, we have developed the CORE model and this is still in pilot form. The model is based on two functional relations, the first predicting demographic-population levels, the second economic-employment levels, both determined by functions of relative accessibility and both having various loops within their structure which incorporate the usual feedbacks between demography and economy. We can divide the variables in this model into four different types

- truly exogenous, reflecting changes in the environment that are not usually driven by policy
- policy variables which are exogenous but determined by the user
- truly endogenous which are those which are traditional dependent variables
- exogenous-endogenous variables lagged in time or determined simultaneously which are both predictors and predicted by the model.

The typical form is as follows where $P_i(t)$ is some measure of demography at time t, while $E_i(t)$ is some measure of economy at the same time period, both variables being measured in zones i which are NUTS0. These variables are lagged in time at $t-1$, $t-2$ and so on, and

form the endogenous-exogenous set. Truly exogenous variables are called $X_i(t)$ and the accessibility variables are defined directly as mixtures of $P_i(t)$, $E_i(t)$, and connectivity between zones i and j called $c_{ij}(t)$,. Parameters of the model equations are given by lower case Greek letters a, b, and so on. Policy variables are defined as $Z_i(t)$. We can state the generic form as follows:

$$\left.\begin{aligned} P_i(t) &= a_1 P_i(t-1) + a_2 E_i(t) + a_3 X_i^p(t) + a_4 Z_i^p(t) + a_5 \sum_j \frac{E_j(t)}{c_{ij}(t)} \\ E_i(t) &= b_1 E_i(t-1) + b_2 P_i(t) + b_3 X_i^e(t) + b_4 Z_i^e(t) + b_5 \sum_j \frac{P_j(t)}{c_{ij}(t)} \end{aligned}\right\},$$

where the various leads and lags in the equation structure reflect the way the model is solved. Essentially there is a good deal of simultaneity in the structure because we consider that the time periods for which the model will be operated are long – 5 years and during this period, the two sectors interact to mutually determine each other. The way the model is to be solved involves beginning with variables at time $t-1$ and then iterating on the above equation structure until convergence. Truly exogenous variables $X_i^p(t)$ and $X_i^e(t)$ might be employments or populations that remain fixed or infrastructures that are unchanging or at least not changeable within the model. Policy variables $Z_i^p(t)$ and $Z_i^e(t)$ can act as dummies switching the relevant variables on and off for example. So far we have only implemented the exogenous variable inputs, not the dummies.

This model can be pictured in block diagram form as follows where the loops indicate how variables influence one another. In any kind of forecasting model which is to predict how different localities might converge or diverge in terms of structure or in which there is considerable interaction between the sectors, this kind of structure is essential.

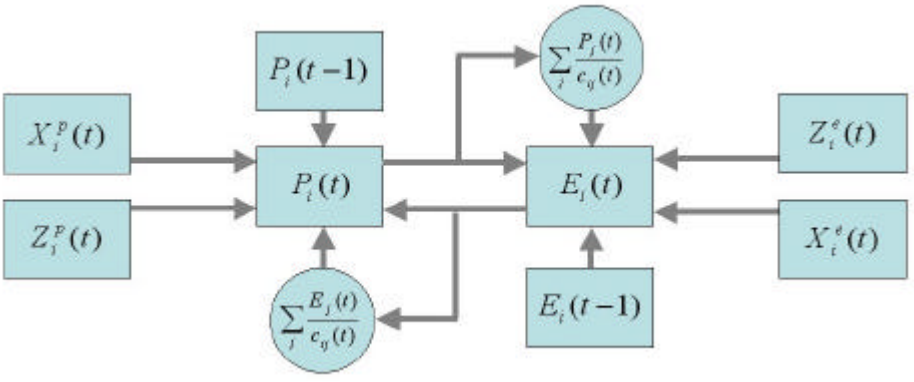


Figure 5-2: The CORE (Country-Region) Model Structure

The model is more like a simulation tool than an econometric structure thus enabling us to intervene in the models operation somewhat more easily. However the structure we will adopt is similar to many of the original forecasting models that are being developed of the European

space economy in that there is a strong spatial element captured through the accessibility potential functions.

Unlike many European forecasting models such as those being developed at Cambridge Econometrics (see Gardiner, 2003), we do not intend to predict economic variables per se. Our model is more physical predicting employment and population and in this sense, our focus is on the spread of population and the location of employment with the potential terms within the model serving to capture issues concerning diffusion. The convergence criteria which is part of many regional econometric models usually refers to monetary data, to incomes and productivities for example, and in this context, we avoid such predictions. The spread of population, for example, might be a proxy for convergence and the model also aims to capture the long-standing characteristic of the richer regions within poorer countries benefiting the most from European integration. However our model is designed to be more of a policy tool to show the effects of changing accessibilities and interventions with respect to economic activities rather than an economic forecasting tool per se.

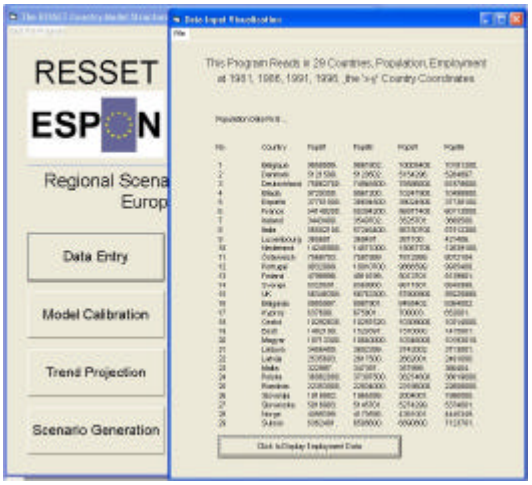
The Pilot Implementation

CORE is written in Visual Basic and as noted above, it comes into its own when it is used over and over again, with the user testing scenario after scenario. Currently it is highly aggregate but as it develops, it will become more compute intensive. It is divided into four stages:

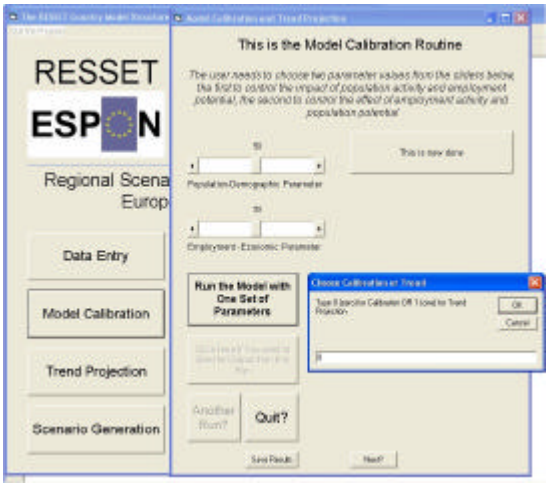
- reading in and examining the data,
- calibrating the model by choosing parameters controlling the relative weights of the population and employment sectors,
- running the calibrated model into the far future to assess the equilibrating properties of the European space and long term trends, and finally
- scenario assessment which involves inputting various exogenous variables as indicated above. The main interface is illustrated in Figure 5-3

Figure 5-3: The CORE Model Structure of RESSET

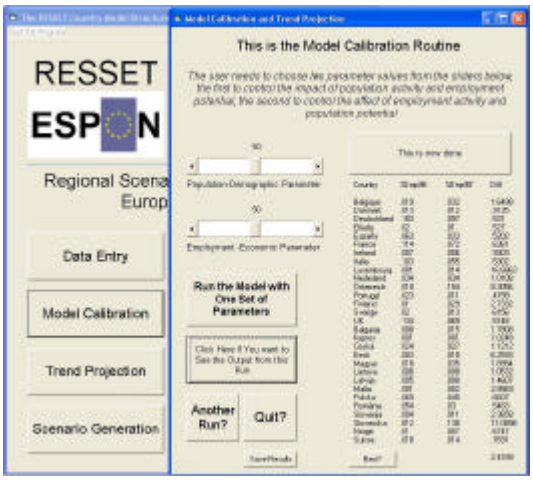
The user clicks on each of the stages in order and a typical sequence is illustrated in Figure 4 where the progression is self-explanatory. Readers are encouraged to download the GUI from http://www.casa.ucl.ac.uk/RESSET.zip and play with it as this is the whole purpose of this kind of scenario generation.



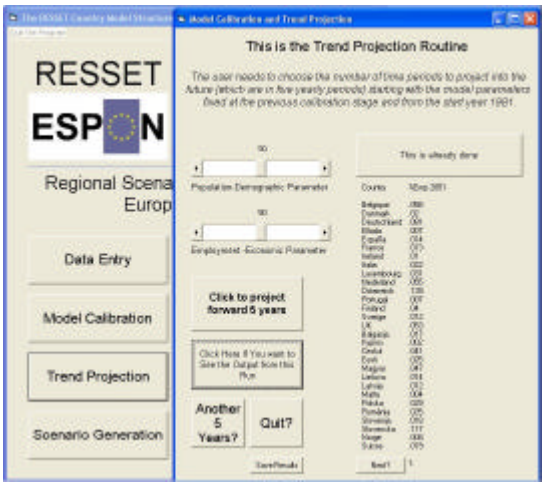
Stage 1: Data Entry, Display and Checking



Stages 2 & 3: Calibration or Trend Projection



Stage 2: Calibration: Choosing Parameters



Stage 3: Trend Projection to the Long Term Future

Figure 5-4: Stages in the CORE Model

5.1.3 Examining the Data, Calibrating the Model

Although our data is the same as that used in the SASI model, we are concerned about its aggregate accuracy. For example, total population in the 29 countries (EU15 + CH + NO + AC12) at 1981, 1986, 1991 and 1996 grows as expected from 468 to 474 to 483 to 489 millions but employment peaks then declines from 193 to 195 to 204 and then down to 195 millions again. We need to get a better grasp on the quality of this data before we launch into more detailed projections later in the study.

Notwithstanding data problems, we have run a simplified version of the model whose equation structure is

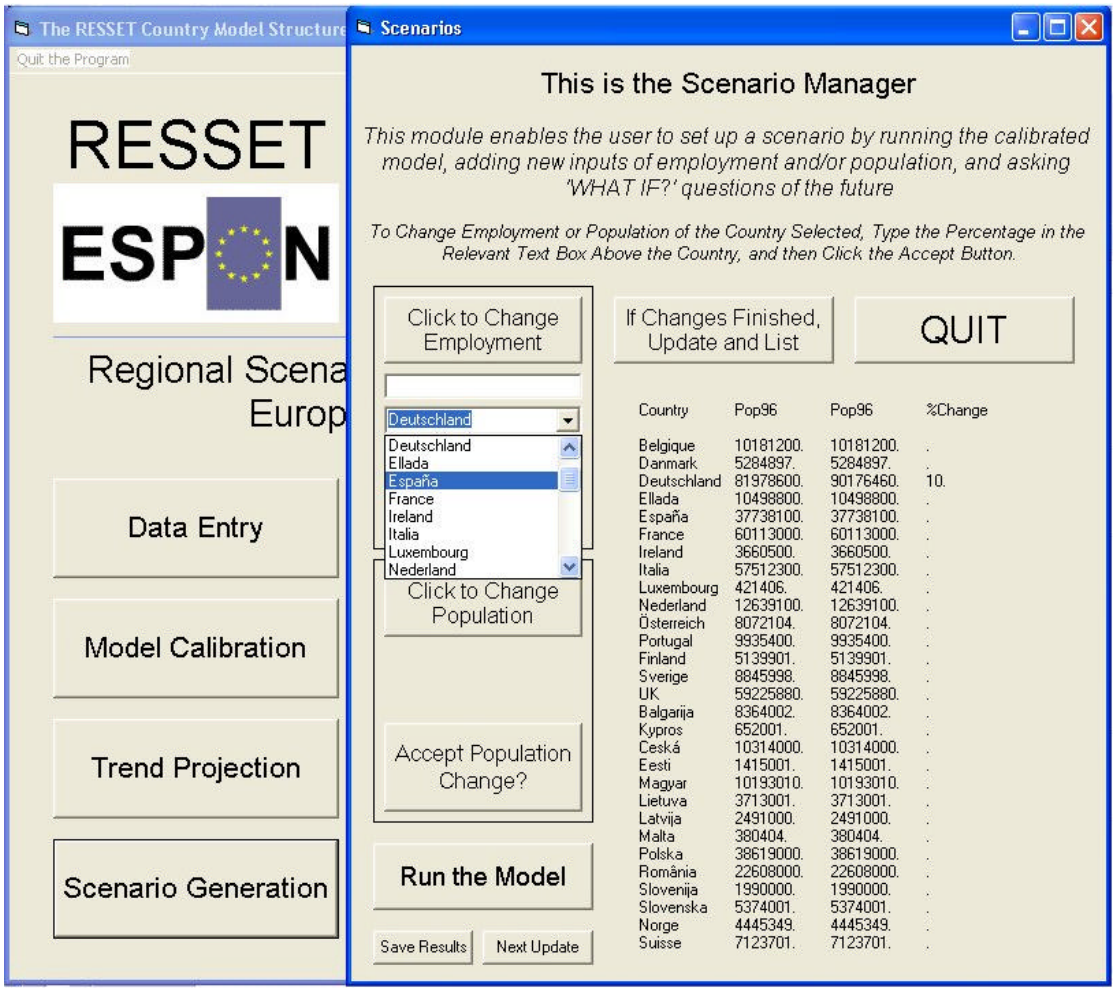
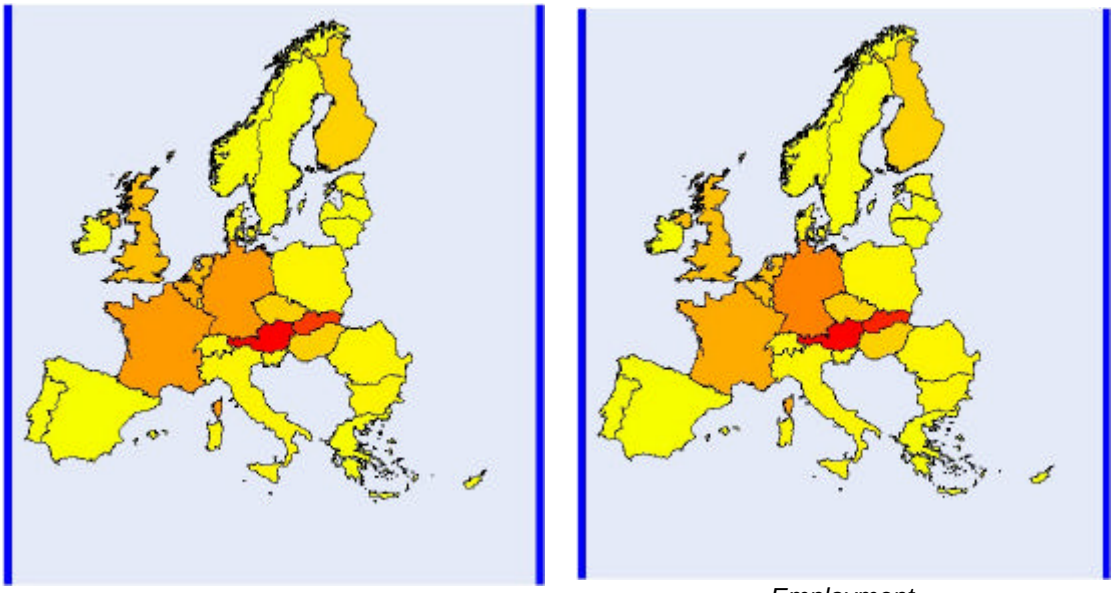


Figure 5-5: Generating, Running and Displaying Scenarios

$$\left.\begin{aligned} P_i(t) &= P_i(t-1) + a\ E_i(t-1) + (1-a)\sum_j \frac{E_j(t-1)}{d_{ij}^2(t-1)} + d(p)X_i^p(t) \\ E_i(t) &= E_i(t-1) + b\ P_i(t-1) + (1-b)\sum_j \frac{P_j(t)}{d_{ij}^2(t-1)} + d(e)X_i^e(t) \end{aligned}\right\}$$

where we now have two parameters to calibrate (based on a model with two equations in two unknowns) with the dummies $d(p)$ and $d(e)$ set equal to 0 at calibration and used to inject population and/or employment into various locations as the basis for future scenarios. In fact this model system can become degenerate if a and b are set to zero as population collapses into employment and vice versa. Thus accessibility potentials are the key to the simulation. Moreover to account for absence of links to the higher level **DECO** model which gives total populations and employment, the **CORE** model is based on predicting population and employment shares where $\sum_i P_i(t) = 1$ and $\sum_i E_i(t) = 1$. Suitable scaling of the model equations ensures that this is the case after each temporal simulation.



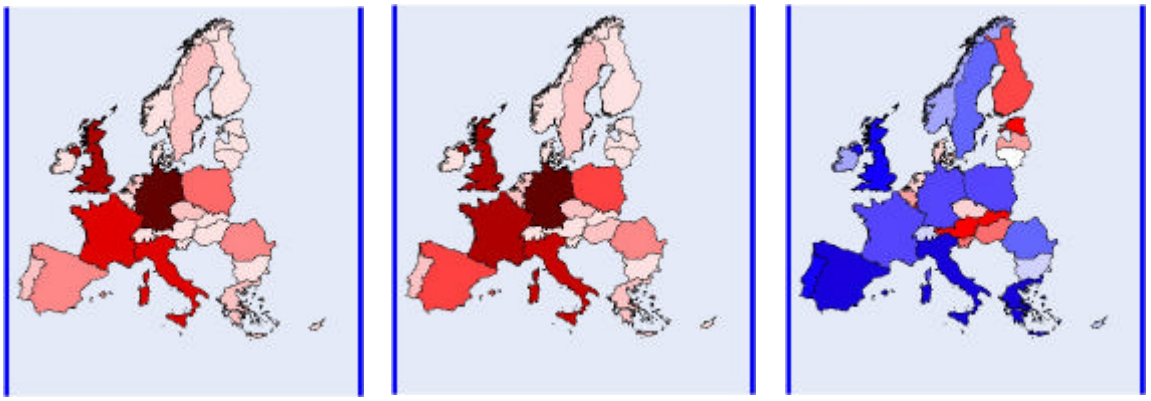
Population *Employment*

Figure 5-6: Accessibility Potentials 1981

As potentials have such an important role in the model, we show those computed for the start of the calibration period (1981) in Figure 5-6. What is immediately clear is that these potentials are biased to the areal core of the ESPON space. This is not so surprising but what it does imply is that this core will be much favoured in any projections with these models. As the model interface allows us to test a wide range of combinations of the parameters a and b (see Figure 5-4), we have chosen a set of parameters to work with which give accessibility a significant role $a = 0.75$ and $b = 0.25$ while ensuring a near optimal fit. Examining the calibration results shows immediately that

- population and employment are under-predicted in countries with the largest populations and emplo yments
- the western European heartland as well as the north-western, west and southern peripheries tend to under-predict while the central Austrian corridor and eastwards over-predicts
- smaller countries in area tend to over-predict

These results are shown in Figure 5-7. A word about all the maps is in order. We do not intend to give specific predictions in terms of values at this stage. Like in the SASI model, we are concerned with shifts and differences. In general in calibration in Figure 5.6, blue shows a lesser share than observed, red a greater share in terms of the difference map. We also urge caution at this stage with respect to our definitions of potential in that we have used a distance adjacency matrix which is between capital cities and we are yet to fine tune all this to take account of intraregional differences. Of course in the final model system such potentials will be taken from the lower level URAL model which will work at the NUTS3 level.



Employment Share 1996 *Population Share 1996* *Ratio Fit of Model 1996*

Figure 5-7: Activity Shares and Calibrated Model Fit at 1996

5.1.4 Preliminary Model Scenario Results

Trend Scenarios

If you refer back to Figure 5-4 which shows the various stages of the model, then a key stage following calibration is to project the calibrated values into the medium and long term future. This will give some idea of where the system is heading. In a sense, what it will show is a kind of long term equilibrium if the ESPON space were as mirrored in the model. We know that this can never be the case as the model is extremely crude and does not take account of any rest of the world sector. The calibrated model is a little bit like treating Europe as an entirely closed, homogeneous system, and it is fairly obvious that in this case, there would be a restructuring towards its areal centre as implicit in the potentials in Figure 5-6. In fact this presents rather a nice contrast with the scenarios we intend to illustrate here which are ones in which exogenous growth is injected to counter such introversion of development.

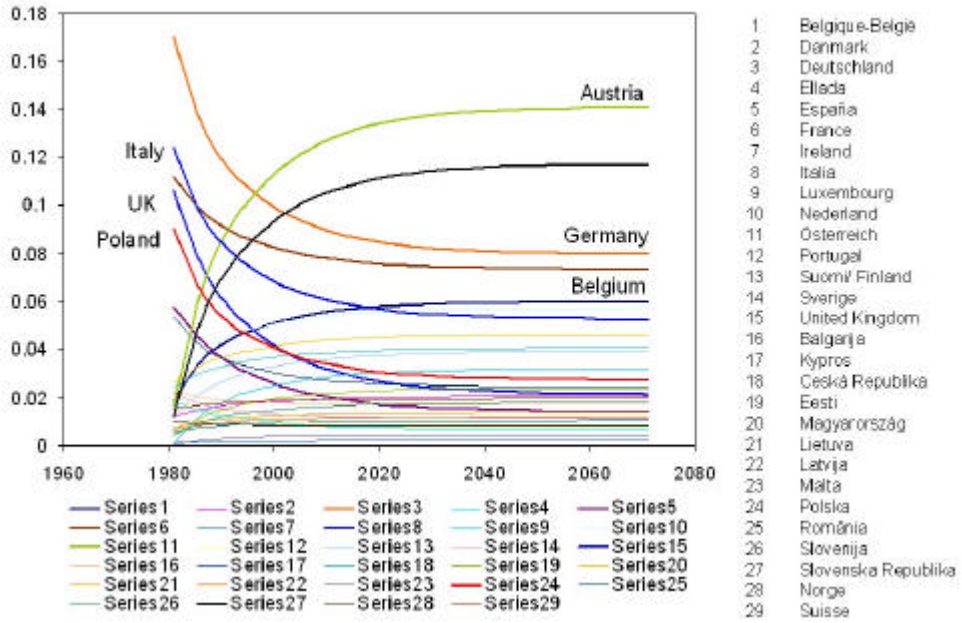


Figure 5-8: 100 year + Trend Scenario: The Very Long Term Redistribution of Employment Activity

Nevertheless, what we have done is to show what this future will look like. In Figure 5-8, we show what happens to employment when we project forward into the very long term future. This is more than 100 years into a future that redistributes everything according to the calibrated model. This has no inertia whatsoever. Basically the patterns noted above reinforce themselves although the growth of the central Austrian belt, and the decline of Italy, UK, Germany and France, all stabilise as expected in this kind of model. This is the implication of a closed Europe with no barriers to movement and a completely mobile population. All we can take from this is that this is the trend in the absence of any other drivers of development. It is a world where smaller countries get bigger and larger get smaller in terms of shares. In a sense, this is a picture of a regional bloc diffusing and diversifying as activity spreads, notwithstanding the fact that the picture is still pretty uneven in the long term steady state.

We show pictures of absolute activity volumes and shifting shares for employment and population in Figure 5-9.

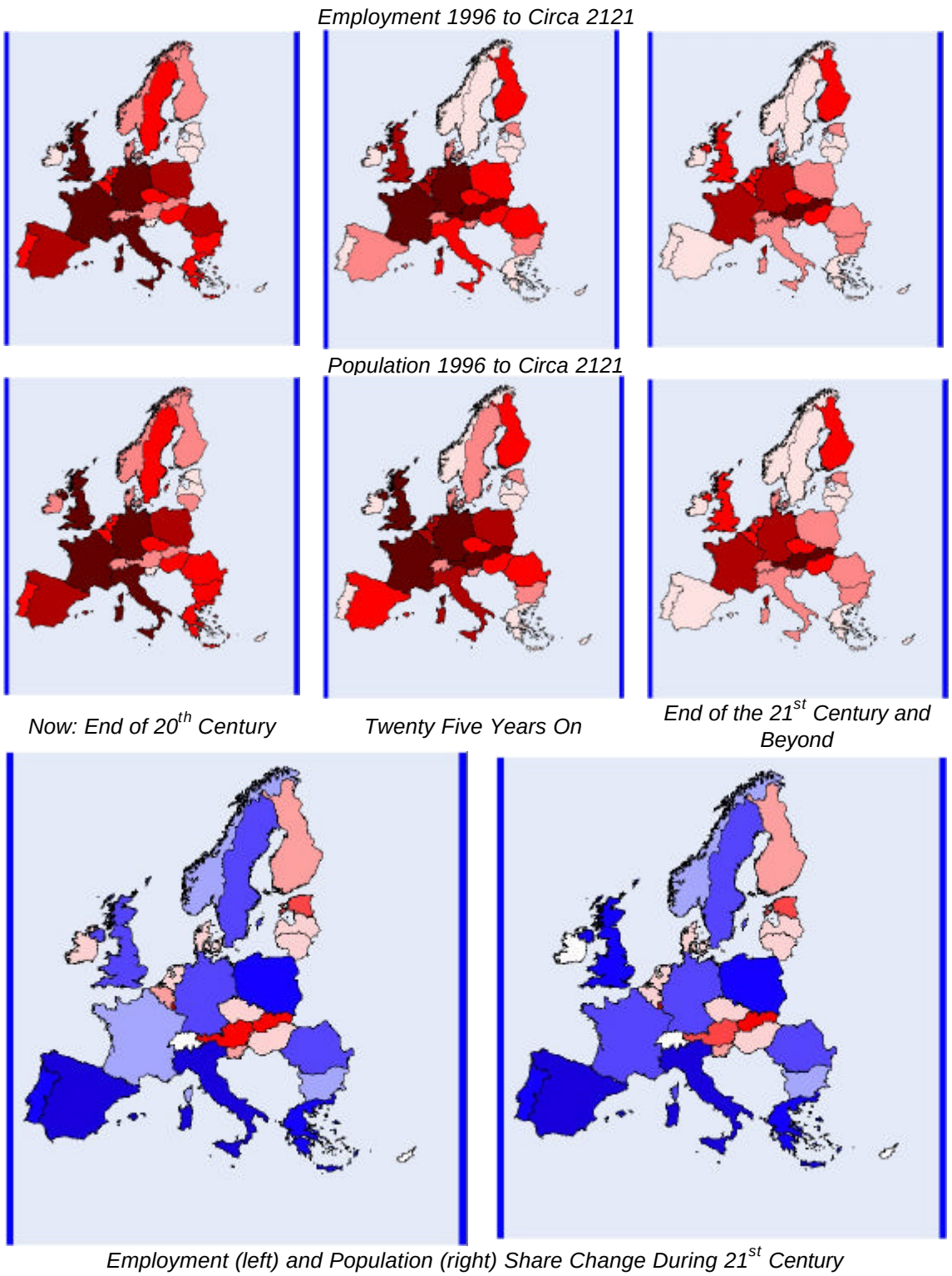


Figure 5-9: Very Long Term Trend Projections in the ESPON Space

Examples of 'What If' Scenarios: Sampling the Scenario Space

We have defined three major and somewhat radical long term scenarios which we list as follows:

- Policies to move jobs from western Europe to the east: injections of employment at levels of 15% or more in the key eastern countries of Poland, Czech, Slovakia, and Hungary. This we assume is a consequence of a declining agricultural base and the need for subsidy to bring employment levels back up.
- The natural growth of western Europe, particularly the Low Countries, UK, France and Germany from East Asian and North American investment, presumably in financial services and related tertiary, quaternary and quinary sectors, adding 15% to employment levels.
- The growth of the south in terms of migrating population to Greece, Spain, Portugal and the islands, adding 15% to these population levels.

We have run Stage 4 of the model (see Figure 5-5) using these assumptions which imply an injection of increased shares to the appropriate countries. Note that the Scenario Manager is actually designed to receive data in the form in which these scenarios are predicated. Note also that as yet we have not implemented any changes in interaction potentials related to accessibility largely because at this stage we consider the **SASI** model to be much superior in this regard. Our role with **RESSET** we believe is to generate 'off-the-wall' thinking about the future and to use this model to inquire about radical alternatives. In time we will temper all this to meet the constraints imposed by feasibility and uncertainty crucial to the project.

We have not yet analysed the detail of these scenarios other than in crude map terms and in terms of percentage changes for the same large blocks used in the SASI model results below. In terms of spatial distributions, the injections of employment and population lead to increases in their equivalents as expected but the spatial spill-over effects are largely confined to the Scandinavian and Baltic Republics and south east Europe in all cases. In fact, accessibility does not impact very greatly in terms of spreading these relevant benefits as Figure 5-10 implies

15% Employment Increase in East | *15% Employment Increase in East* | *15% Population Increase in Mediterranean Areas*

Figure 5-10*: Percentage Differences from the Trend Scenario Due to Exogenous Investments as Specified*

The last analysis we will produce here shows the impact of these changes on four different regional blocks. In Table 5-1, we show the percentage gain or loss over the steady state share for each scenario for the following three regions: EU15, CH+NO, AC12 which compose the entire 29 country ESPON Area.

Scenario	EU15	CH+CO	AC12
Eastern Growth	0.53 0.53	2.19 2.19	0.52 0.52
Western Growth	0.42 0.43	1.88 1.91	-1.50 -1.52
Southern Migration	-0.18 -0.18	-0.82 -0.81	0.56 0.56

Table 5-1: Percentage Shifts in Activity Shares Due to Investment and Migration first row is employment, second row is population

Table 5-1 shows that the shifts are quite small with the western growth having the biggest impacts on the west itself and on CH+CO. In fact it would appear from these impacts that it is more difficult to generate spill-over effects in the eastern than the western or southern regions of the EU but that the non-EU members benefit most from any investment in jobs in the west or east. These results are highly tentative and in the spirit of the model we are developing, we consider that these sorts of informed speculation on the future must be the basis for considered discussion, no more and, of course, no less.

5.2 Scenario Study 2: Impacts of the TEN-T and TINA projects on the regions in the new member states

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 been addressed 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 will be the regional economic model SASI used simultanously in ESPON 1.1.3 and 2.1.1. In ESPON 1.1.3, the SASI model is developed and used to forecast the socio-economic development of the regions in the accession countries after their entry into the European Union taking account of the expected reduction of border barriers, such as waiting times and customs procedures and of different scenarios of implementation of the TEN-T and TINA projects.

5.2.1 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 and GDP per capita. 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 and polycentricity indicators expressing the impact of transport infrastructure investments on the polycentricity of national urban systems 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. 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 spatial development objectives of the European Union.

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). 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 TEN-T and TINA planning documents.

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 equitdevelopment by modelling not only production (the demand side of regional labour markets) but also population (the supply side of regional labour markets). A second distinct feature is its dynamic network database based on a 'stratey. Figure 5-11 visualises the interactions between these submodels.

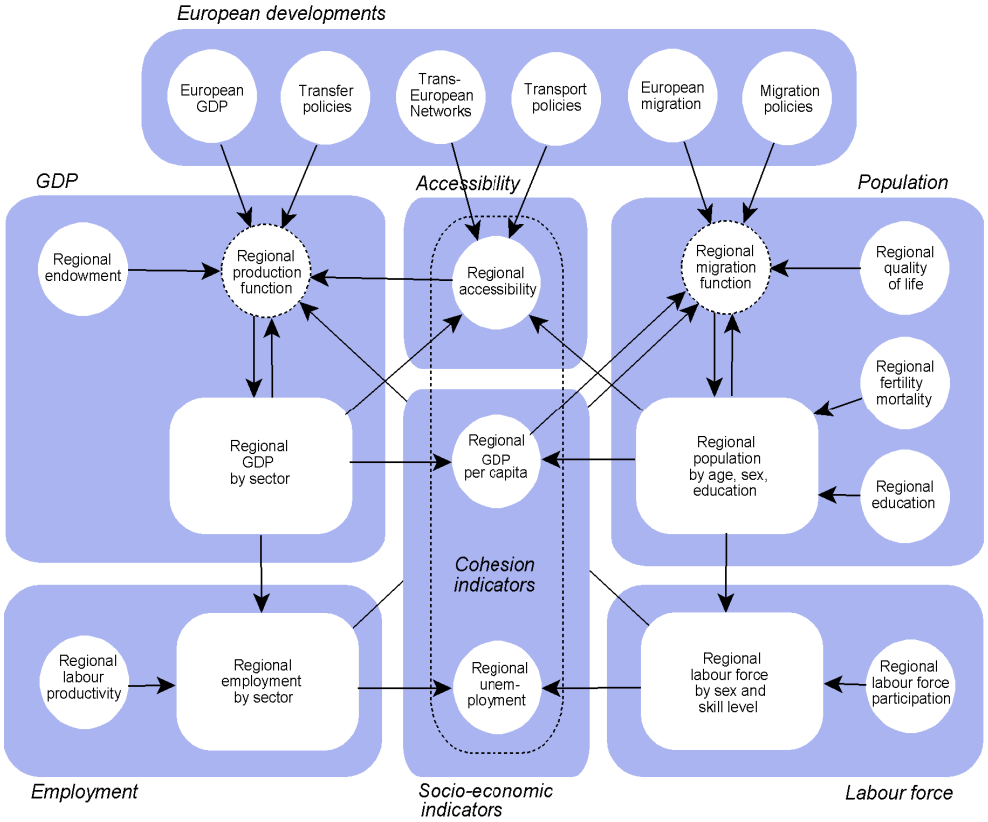


Figure 5-11: The SASI model

The *spatial* dimension of the model is established by the subdivision of the European Union and the twelve accession countries in eastern Europe plus Norway and Switzerland in 1,321

regions and by connecting these regions by road, rail and air networks. 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, i.e. 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 calibration for ESPON can be found in the Final Report of ESPON 2.1.1.

5.2.2 Preliminary model results

In ESPON 2.1.1 thirteen transport policy scenarios were simulated with the calibrated SASI model. Here, as a preview of the information from Scenario Study 2, the results of two of them of special relevance for the new member states are briefly presented:

- *Scenario B2*: All TEN and TINA projects 2001-2021. Scenario B2 assumes that in the period 2001-2001 all designated TEN-T and TINA transport infrastructure projects are implemented as documented in the latest revisions of the TEN-T and TINA programmes (European Commission, 1999; 2002; 2004 and TINA, 1999; 2002).

- *Scenario B5*: TEN/TINA projects only in the cohesion/accession countries 2001-2021. Scenario B5 assumes that political emphasis is given to transport infrastructure projects in the cohesion and accession countries at the expense of projects in the European core.

In addition, a third scenario assuming the implementation of an extended list of transport infrastructure projects in the accession states was simulated:

- *Scenario B6*: All TEN projects and an extended list of TINA projects 2001-2001. This scenario was proposed by Tomasz Komornicki and Piotr Korcelli in the EU 5th Framework project IASON (Bröcker et al., 2004).

All three scenarios are compared with a Reference Scenario in which it is assumed that no new infrastructure projects are completed after 2001.

The results presented are preliminary because important model extensions necessary for modelling the spatial impacts of enlargement, such as regional subsidies, regional tax competition and the effects of national migration constraints are not yet implemented in the SASI model.

Accessibility

Table 5-2 shows summary results for accessibility of the three scenarios. The numbers are differences between the policy scenario and the Reference Scenario in 2021 in percent for the old EU member states (EU15), Switzerland and Norway (CH+NO), the twelve accession countries, i.e. the ten new EU member states plus Bulgaria and Romania (AC12) and the ESPON Space as a whole (ESPON). Figure 5-12 shows the temporal development of accessibility averaged over EU15 and AC12 between 1981 and 2021. Figure 5-13 shows the spatial

distribution of accessibility in the Reference Scenario and the impacts of the three infrastructure scenarios.

Table 5-2: SASI model: accessibility

Scenario		Accessibility difference between policy scenario and Reference Scenario (%)			
		EU15	CH+NO	AC12	ESPON
B2	TEN/TINA projects	+13.01	+12.55	+15.65	+13.46
B5	TEN/TINA only in cohesion countries	+2.13	+1.32	+5.90	+2.77
B6	TEN/TINA + maximum TINA projects	+15.22	+14.00	+25.32	+16.95

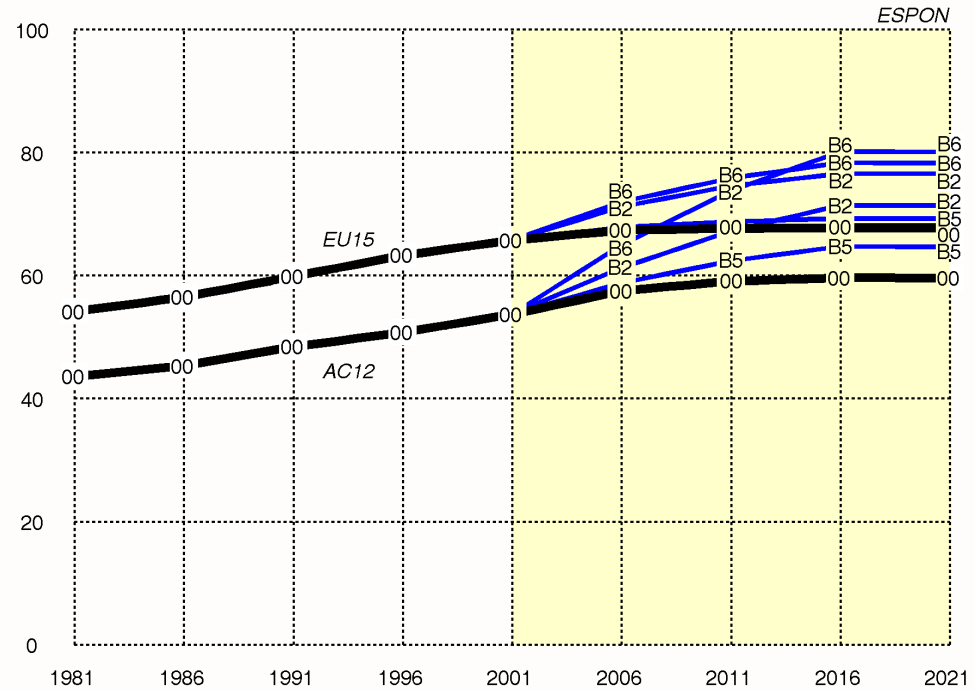


Figure 5-12: Development of accessibility in the old EU member states and in the accession countries 1981-2021

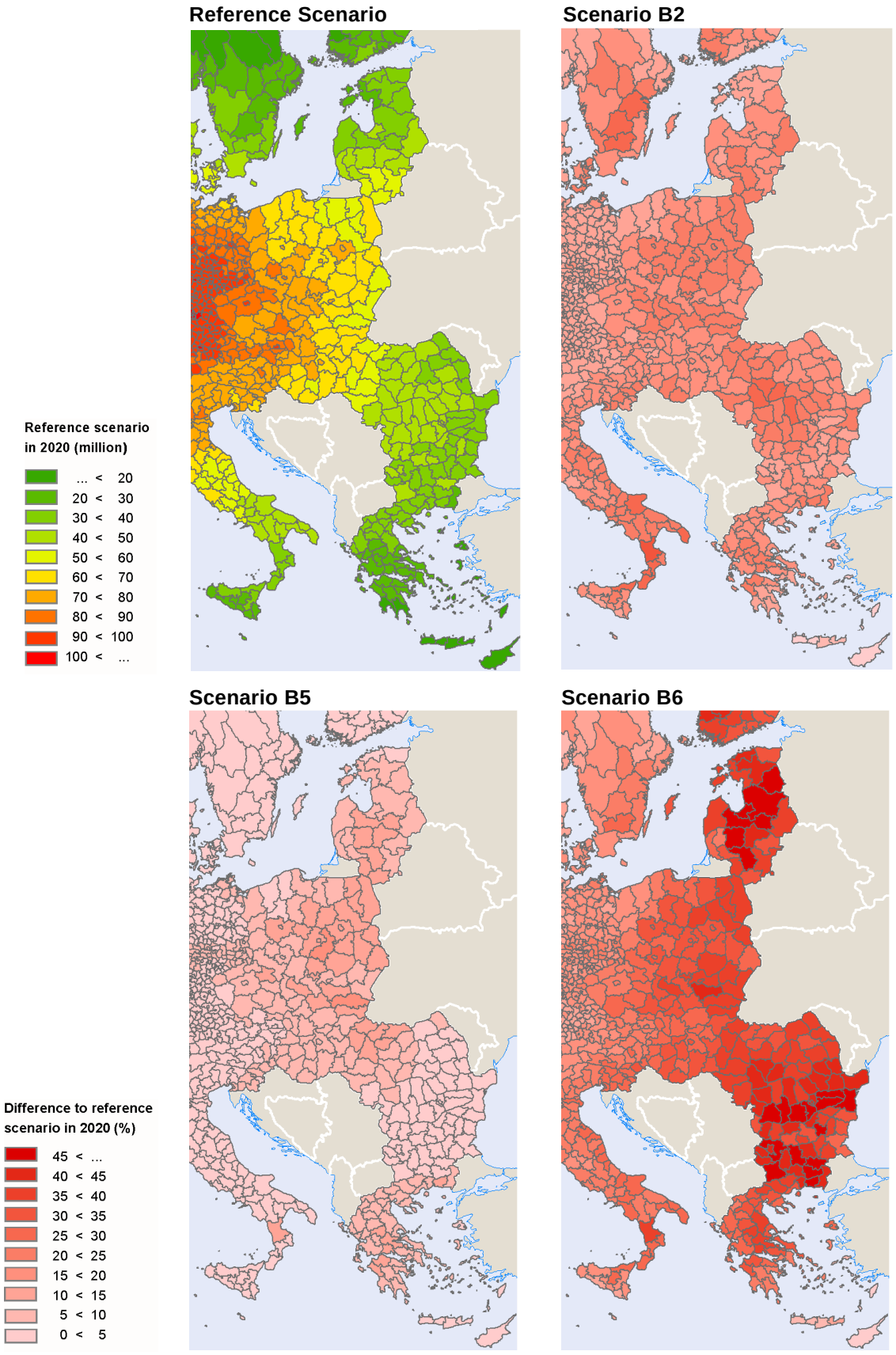


Figure 5-13: Accessibility in the Re ference Scenario and Scenarios B2, B5, B6

The two heavy black lines in Figure 5-12 represent the development of accessibility in the Reference Scenario in EU15 and AC12 between 1981 and 2021, the thinner blue lines show how the three infrastructure scenarios deviate from the Reference Scenario after 2001

All three scenarios improve accessibility everywhere, with the greatest improvements in the accession countries. This is due to the greater emphasis on infrastructure projects in eastern Europe in the recent TEN and TINA planning documents.

Projects in the accession countries themselves (Scenario B5) contribute little to this improvement; more important are the corridors linking the accession countries to western Europe. However, if the number of projects in the accession countries is increased (Scenario B6), the effect is larger. The gap in accessibility between western and eastern Europe remains in all scenarios except in Scenario B6.

GDP per capita

Table 5-3 shows the results for GDP per capita of the three scenarios as differences between the policy scenario and the Reference Scenario in 2021 in percent for the old EU member states (EU15), Switzerland and Norway (CH+NO), the twelve accession countries (AC12) and the ESPON Space (ESPON). In addition to the unstandardised values, the results are also standardised as percent of average GDP per capita in the ESPON Space to show the relative losers among the regions. The unstandardised values include generative effects, whereas the standardised values shows distributional effects that would occur if there were no generative effects (zero-sum game). Figure 5-14 shows the spatial distribution of GDP per capita in the Reference Scenario and the impacts of the three infrastructure scenarios.

Table 5-3: SASI model: GDP per capita

Scenario	GDP per capita difference between policy scenario and Reference Scenario (%)			
	EU15	CH+NO	AC12	ESPON
Unstandardised				
B2 TEN/TINA projects	+2.62	+2.39	+3.06	+2.62
B5 TEN/TINA only in cohesion countries	+0.44	+0.21	+1.19	+0.46
B6 TEN/TINA + maximum TINA projects	+3.11	+2.69	+5.49	+3.20
Standardised (ESPON=100)				
B2 TEN/TINA projects	–0.01	–0.23	+0.43	0.00
B5 TEN/TINA only in cohesion countries	+0.02	–0.25	+0.73	0.00
B6 TEN/TINA + maximum TINA projects	–0.08	–0.49	+2.22	0.00

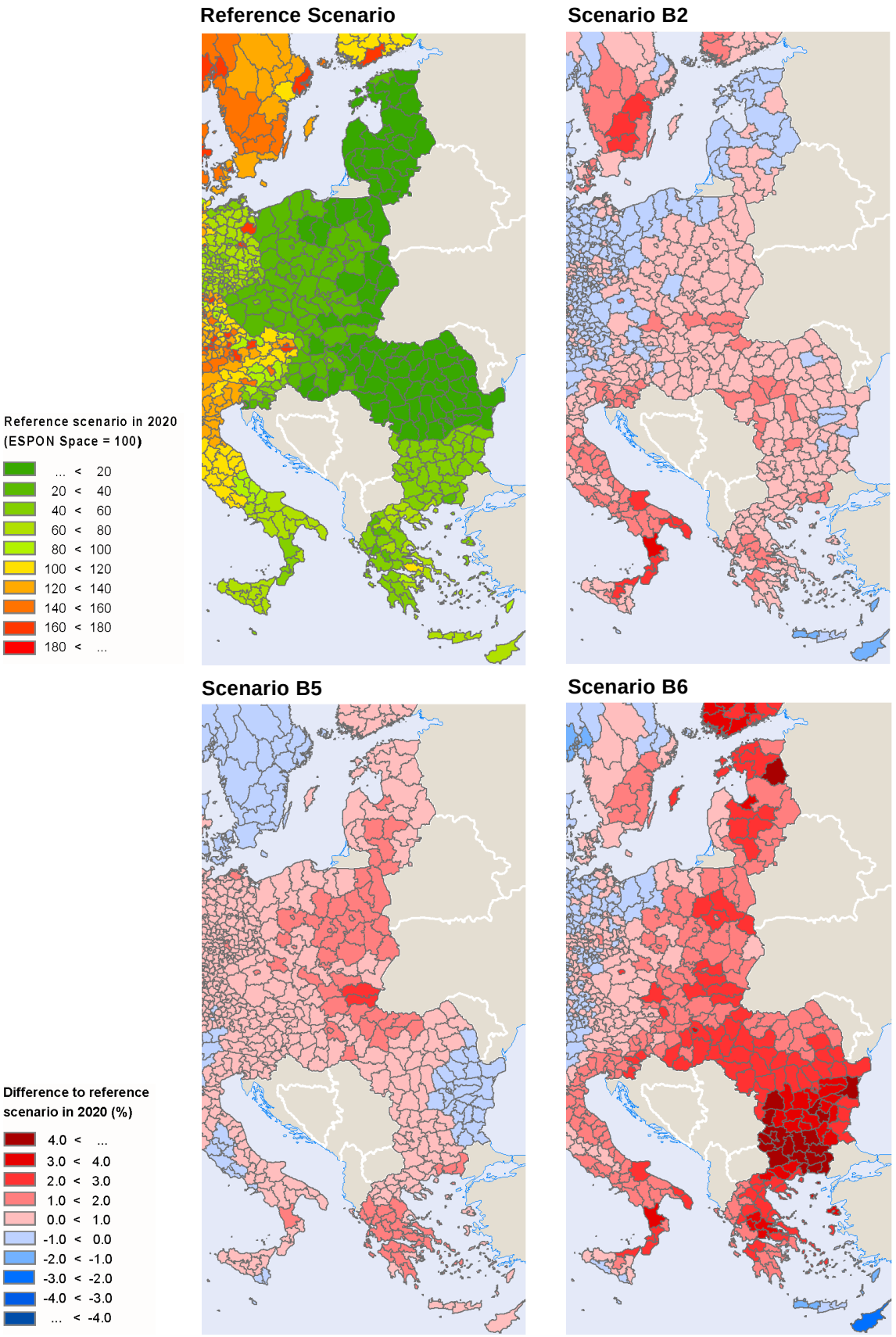


Figure 5-14: GDP per capita in Refe rence Scenario and Scenarios B2, B5, B6

The first thing to note in Table 5-3 is that relative large changes in accessibility translate into only very small changes in economic activity. If only distributional effects are considered, the changes are even smaller. But again the accession countries are the absolute and relative winners. In absolute terms, Scenario B5 is the least profitable for the accession countries, but in relative terms Scenario B5 performs better than the full TEN/Tina scenario B2. In both absolute and relative terms, as expected, Scenario B6 with maximum additional infrastructure projects in the accession countries produces the largest gain for the accession countries.

For the maps in Figure 5-14 also the standardised values of GDP per capita (ESPON=100) were used. The map of the Reference Scenario shows the gap in wealth between the old member states and the accession countries. The other three maps show the impacts of the three scenarios: which regions gain (in red) and which regions lose (in blue) compared to the Reference Scenario. As already Table 5-3 indicated, the accession countries gain more if more infrastructure projects on their territory are implemented. However, none of the scenarios closes the gap in economic performance between the old and new member states. This underlines that transport infrastructure alone is not enough to significantly reduce the existing economic disparities between western and Eastern Europe. However, massive provision of transport infrastructure as in Scenario B6 would contribute to that goal.

Cohesion

The SASI model calculates a range of cohesion indicators to measure the convergence or divergence of economic conditions under different scenarios. Two dimensions are relevant if cohesion indicators are to be compared:

- The first dimension is the area considered. Cohesion at the European level means a reduction of economic disparities between the rich regions in the European core and the poorer regions at the European periphery or, after the enlargement of the EU, between the western and eastern member states. Cohesion at the level of level of meso-regions or individual countries looks at the economic disparities within these areas. Unfortunately, both types of cohesion may be in conflict.

- The second dimension is the cohesion indicator used. It has been demonstrated in ESPON 2.1.1 that different cohesion indicators give different results (Bröcker et al., 2004). Some commonly used indicators even indicate convergence where in fact divergence has occurred. One important distinction is whether the indicator measures relative or absolute convergence or divergence – if, for instance, all regions gain in relative terms by the same percentage, the richer regions gain more in absolute terms.

Table 5-4 and Table 5-5 show the cohesion effects of the three infrastructure scenarios with respect to the distribution of accessibility and GDP per capita, respectively, compared to the Reference Scenario. For easier reading the information is simplified: a plus-sign indicates a pro-cohesion effect (i.e. disparities become smaller) and a minus-sign indicates an anti-cohesion effect (disparities grow larger). Five different cohesion indicators were calculated for the ESPON Space (ESPON) and the accession countries (AC12). The five indicators are indicators commonly used in the literature; the first four measure relative convergence or divergence, the last one measures absolute convergence or divergence.

Table 5-4: SASI model: accessibility cohesion effects

Scenario	Accessibility cohesion effects (+/–)				
	CoV	Gini	G/A	RC	AC
ESPON Space (ESPON)					
B2 TEN/TINA projects	++	++	++	++	–
B5 TEN/TINA only in cohesion countries	+	+	+	+	–
B6 TEN/TINA + maximum TINA projects	++	++	++	++	–
Accession countries (AC12)					
B2 TEN/TINA projects	+	+	·	+	––
B5 TEN/TINA only in cohesion countries	–	–	–	–	––
B6 TEN/TINA + maximum TINA projects	++	++	++	++	––

+/++ Weak/strong cohesion effect: disparities reduced
–/–– Weak/strong anti-cohesion effect: disparities increased
· Little or no cohesion effect

CoV Coefficient of variation (%)
Gini Gini coefficient (%)
G/A Geometric/arithmetic mean
RC Correlation relative change v. level
AC Correlation absolute change v. llevel

Table 5-5: SASI model: GDP/capita cohesion effects

Scenario	GDP/capita cohesion effects (+/–)				
	CoV	Gini	G/A	RC	AC
ESPON Space (ESPON)					
B2 TEN/TINA projects	+	+	·	+	––
B5 TEN/TINA only in cohesion countries	+	+	+	+	–
B6 TEN/TINA + maximum TINA projects	+	+	+	+	––
Accession countries (AC12)					
B2 TEN/TINA projects	–	–	·	+	––
B5 TEN/TINA only in cohesion countries	+	+	·	++	–
B6 TEN/TINA + maximum TINA projects	–	–	–	––	––

+/++ Weak/strong cohesion effect: disparities reduced
–/–– Weak/strong anti-cohesion effect: disparities increased
· Little or no cohesion effect

CoV Coefficient of variation (%)
Gini Gini coefficient (%)
G/A Geometric/arithmetic mean
RC Correlation relative change v. level
AC Correlation absolute change v. llevel

A methodological difficulty in forecasting polycentricity is that polycentricity is studied with cities as geographical units, whereas the SASI model is based on NUTS-3 regions. Therefore the following assumptions were made to bridge the gap between NUTS-3 regions and cities:

- *Size Index*. The population and GDP of a city change as the population and GDP of the NUTS-3 region in which it is located.

- *Location Index*. The number of cities and hence the number and size of service areas remain constant.

- *Connectivity Index*. The accessibility of a city changes as the accessibility of the NUTS-3 region in which it is located.

Figure 5-15 shows the development of the Polycentricity Index (see Section 2.2) between 1981 and 2021 calculated on the basis of functional urban areas (FUAs) with the SASI model using the above assumptions.

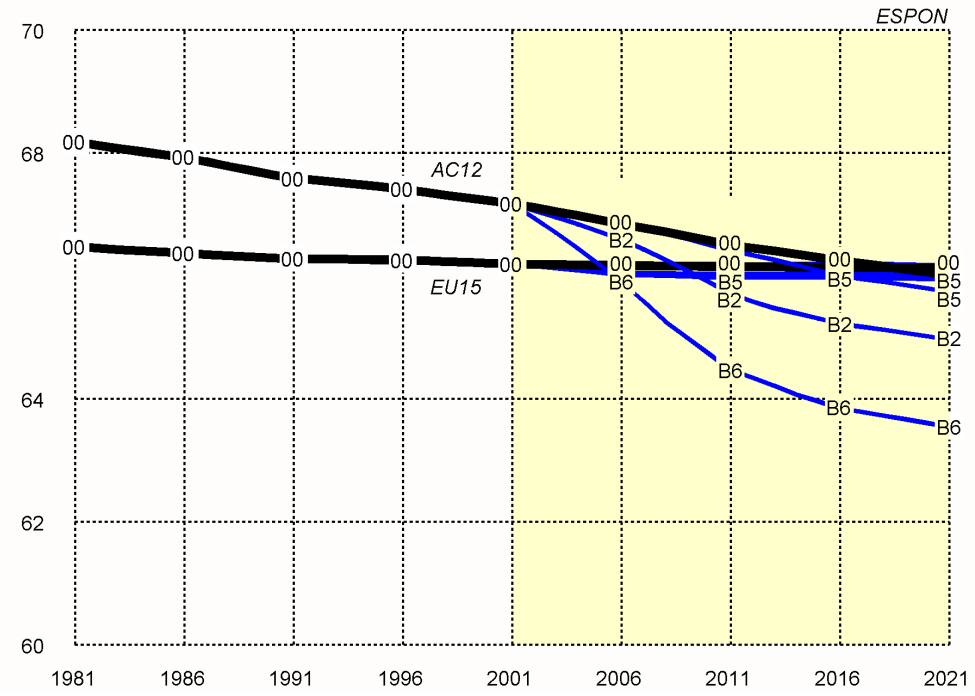


Figure 5-15: Development of polycentricity in the old EU member states and the accession countries 1981-2021

The two heavy black lines in Figure 5-15 represent the development of the Polycentricity Index between 1981 and 2021 averaged over the countries of EU15 and AC12, the thinner blue lines indicate how the three infrastructure scenarios deviate from the Reference Scenario after 2001.

The diagram confirms that the urban systems of the accession countries are at present on average more polycentric than those of the old member states (see Section 2.2). According to

the backcast, they were even more polycentric in the past, probably because of their history as planned economies in which there was no market-driven spatial development.

However, if the forecasts of the model are correct, polycentricity in the accession countries will decline due to market forces and in the medium-term be even lower than that of the old member states. Polycentricity in the old member states declines, too, but much slower than in the accession states because of their longer experience with market-driven spatial development, and in the long run even comes to a halt.

This is possibly also the reason why the infrastructure improvements in the three scenarios have almost no effect on polycentricity in the old member states. Another reason may be that the transport networks in the old member states are already highly developed and can only marginally be improved. However, in the accession countries there is still a great demand for transport infrastructure and so infrastructure improvements have much larger effects. As it has already been observed in the discussion of cohesion, infrastructure improvements tend to be oriented towards the largest cities with the effect that polycentricity goes down in proportion to the volume of infrastructure improvements in the scenarios.

5.3 Towards policy conclusions

According to the time schedule of ESPON 1.1.3, the main work on the two scenario studies will be conducted in the final year of ESPON 1.1.3. Therefore here only preliminary remarks on the expected results of the two studies can be made.

Scenario Study 1

We tested four scenarios including the extrapolation of the calibrated (1996 situation with a view to examining the long term steady state in terms of the attraction of population and employment to each of the 29 countries. We summarise our findings as follows:

- the largest accessibilities are in the areal core of the New Europe and our model picks this up, shifting population and employment towards this heartland in the absence of inertial factors which mitigate this redistribution. This is the essence of the trend projections
- There are considerably less spill-overs from new activity in different countries into other countries than we expected.
- There is a tendency for the west to capture more activity than the east even when the east is favoured in terms of investment/subsidies in employment
- There is a general spreading of activity throughout the new Europe which is tantamount to a redistribution from large to small countries and from peripheral to core, with the exception of Scandinavia and the Baltic States that appear somewhat of an exception, capturing activity from Poland and Germany.
- The migration south scenario benefits the west rather than the east but the two non-EU countries Switzerland and Norway, appear to benefit most from any of the scenarios

tested. This is probably due to their inclusion in the model rather than any innate advantages which are built into the model.

Scenario Study 2

As the transport infrastructure scenarios specifically designed for ESPON 1.1.3 will be developed only in the final year of the project, here only some preliminary findings of the backcasts and forecasts undertaken in ESPON 2.1.1 are summarised:

- Transport infrastructure improvements in the accession countries and between the accession countries and the old EU member states contribute to bridging the economic gap between the old and new member states.

- Transport infrastructure improvement alone are not sufficient for significantly reducing the economic disparities between the old and new member states; they have to be integrated with other policies.

- Transport infrastructure projects that improve the transport corridors between the old and new member states are more important than transport infrastructure projects within the accession countries.

- Transport infrastructure improvements designed to reduce spatial disparities at the European level are likely to increase spatial disparities within the accession countries at large or within individual countries..

- In the past two decades polycentricity has declined in all European countries due to the faster growth in accessibility, economic activity and population of the larger metropolitan areas. The decline in polycentricity is likely to continue in the future.

- The urban systems in the accession countries are on average still more polycentric than those of the old EU member states. However, the decline in polycentricity in the accession countries is faster than that in the old member states and is likely to continue in the future.

- Except the transport pricing scenarios, all transport policy scenarios examined in ESPON are likely to accelerate the decline in polycentricity in the accession countries.

These tentative results will be substantiated during the final year of ESPON 1.1.3.

Further work

Work in the final year of ESPON 1.1.3 for the two scenario studies will concentrate on model development and calibration, the definition of scenarios and the simulation and interpretation of the results.

Particular emphasis will be placed on the comparability of the results of the two models. This will be achieved by early co-ordination of the spatial and temporal resolution and scope of the two models, the specification of comparable output indicators and the definition of common background scenarios for the policy scenarios to be examined.

The work will conclude with policy conclusions and recommendations based on the results of the two models.

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Chapter 6. Making Policy Recommendations for Enlargement: Policy Combinations

Lars Olof Persson and Lisa Van Well

When the European Union increased in population by 28 percent and expanded its territory by 34 percent on 1 May 2004, new challenges and possibilities of the enlarged Union have advanced to the forefront of European spatial development, particularly with regard to cohesion policy and sustainable economic, social and ecological development. The challenges and possibilities that enlargement poses have not taken the Union by surprise, as indeed efforts have been forthrightly underway since the process to develop the European Spatial Development Perspective (ESDP) began in 1993. ESPON 2006 is one of the current efforts to address the spatial tissue of the Europe in its near entirety (EU27+2) with its mandate to indicate, map and diagnose spatial development of the European territory. Also explicit in the ESPON mandate is to develop policy recommendations grounded in rigorous quantitative and qualitative data and research.

Yet making policy recommendations for such a vast and diverse territory and culturally, socially and historically heterogeneous population is no easy task. This task is further complicated by the fact that the European Union does not enjoy competency in the area of Spatial Development Planning (although it does wield a great power through the Structural and Cohesion Funds). Thus any serious attempt to make policy recommendations must first take up the question of *to whom* the recommendations are addressed. The ESPON programme encourages a *multi-level approach* to policy recommendations with efforts directed at the EU level, the nation state level and the regional/local level, as well as a *cross-sectoral approach* to ensure that the norms sustainable and cohesive spatial development are reflected in all policy areas of the EU and member states.

In this paper we present the policy "Combination" approach being developed by ESPON project 1.1.3 and put the "art and science" of making policy recommendations into a broader context of multi-level governance. First we examine the driving forces and dilemmas of the EU10 Accession countries, as enumerated by Inotai. We then erect a preliminary framework for making policy combinations for the spatial developed of the enlarged Union based on the concepts of governance, norms and the logics of consequences and appropriateness. The case of spatial consequences for an enlarged EU is subsequently presented, along with a delineation of two "rationales" in which to make recommendations. Finally we summarize the analysis and give some practical suggestions for the process of making policy combinations.

6.1 Ten Accession Countries – Common Features and Challenges to European Spatial Policy

In order to better understand the driving forces and dilemmas connected to their accession to the EU, Inotai (2003)[1] summarizes seven common characteristics of EU10, largely rooted in history. Together these cover a wide range of challenges to European policy in general and spatial policy in particular.

A. A Buffer Zone over centuries

During the last 1000 years these ten countries have always been parts of a buffer between West and East. This feature will remain also after accession. The new challenge is to redefine the future borders of Europe in terms of security. This has to take into account the interests of the new neighbours, but not at the expense of the new Member states relying on new security systems in Europe and the North Atlantic.

B. Economic Periphery and Peripheralization

The highly differing income levels reflecting differences in economic and industrial activity between neighbouring countries in Eastern Europe puts an intensive pressure to reinforce and speed up the catching up process.

C. Cultural and Ethnic Diversity

The regions of East Central, and South Eastern Europe as well as Eastern Baltic Sea region are multicultural regions, with corresponding problems and potential advantages. The cultural diversity has a spatial pattern. These parts of Europe have to overcome its historical burdens only if the advantages of multicultural cooperation prevail against perceived complaints of the past.

D. Top-down versus Bottom-Up Development Patterns

Most countries in the region are the historical products of top-down development. The results were both positive and negative: individual survival techniques, high levels of flexibility, and innovative behaviour at the one hand, and a subsidy mentality, corruption, tax evasion and overriding of centrally set rules on the other. The transformation into a decentralized and responsible development pattern, which started in the end of 1980s, is still an important challenge, in particular in designing and implementing regional policy.

E. Failure at the Threshold

Throughout their history many of the countries within EU10 have been ready to pass the threshold to reach the development path in the Western countries, but have never quite reached the mark. The reasons have been sometimes a war coming up, sometimes political or institutional failures. In the current process it is obvious that

[1] Inotai, A., 'The Eastern Enlargement of the EU', in Cremona, M., 2003 The Enlargement of the European Union. Oxford University Press

there must be realistic expectations on how fast modernization can take place, and that institutions facilitating integration have to be installed.

F. Modernization Anchor Outside the Region

There is little doubt that the modernization anchor until now remains located outside its geographic frontiers and explains why regional cooperation has been limited in the past. However, as these countries now accede the EU, the prospects for regional cooperation should improve spectacularly, in trade, investments and joint infrastructural and environmental projects.

G. Economic Modernization versus National Sovereignty

Today we can see that in many countries in EU10 there is a certain split in the society. On the one hand, they accept that their key to economic modernization is the EU. On the other hand they would like to keep their political sovereignty. The challenge is that shared sovereignty, interdependence, practical strategic alliances, flexibility are the most important requirements in order to protect national interests in the new enlarged EU.

6.2 Governance and the European Spatial Development

It has become increasingly popular to utilize the term "governance" in local politics (Cars et al 2002), national politics (Keohane 2001, Young 1999) and even European Union politics (White Paper on European Governance, Jachtenfuchs and Kohler-Koch 2003). Governance definitions vary, but most are quite general and usually posited against more traditional conceptualizations of "government" (Cf ESPON 1.1.1 SIR). Others define governance via the actors involved in the process, with the "government" connotation including the actions of the public sector and formal political and executive functions. "Governance" subsequently expands and diversifies the scope of operative agents to include civil society organisations, business interests and public participation. Other definitions conceptualise governance as a goal-oriented process (involving diverse actors). Jachtenfuchs and Kohler-Koch (2003:4) see governance as "… the continuous political process of setting explicit goals for society and intervening into it in order to achieve these goals". For the purposes of making policy recommendations for European spatial development policy, the idea of governance is a useful point of departure since it implies that recommendations should not only be directed to national, regional and local governments and the European Commission, but also to the plethora of other actors involved developing, implementing and monitoring the goals and norms of the European spatial development. The Third Report of Economic and Social Cohesion (18 Feb. 2004) reiterates the need for a wider governance perspective to social and economic policy. "There is a growing consensus about the importance for regional competitiveness of good governance – in the sense of efficient institutions, productive relationships

between various actors involved in the development process, and positive attitudes towards business and enterprise" (2004: xi)

Parallels for the European governance perspective are often found in the European integration perspectives of the 1990s where "(i)nstead of thinking in terms of the Community's capacity to impose decisions forcibly on the member governments, integration has to be considered as some sort of symbiosis between the Community and national systems. As a result, actors tend more and more to define their roles in terms of joint problem-solving rather than as agents of one system or another" (Soetendorp in Carlsnaes 1994:108). Governance only augments the range of actors involved and focuses on process rather than static institutions.

6.3 Spatial Development as a Normative Process

Spatial development is still the formal and legal domain of national and local governments. While the EU does not have full competence in the area spatial development, it has been active in producing a set of common norms for the area. *Norms* describe "collective expectations for the proper behavior of actors with a given identity" (Katzenstein 1996:5). They differ from policies or regulations in that they have weak legally enforceable qualities. Rather norms prescribe or proscribe the range of acceptable actions for an actor (governmental or non-governmental) that adheres to a certain identity. Some norms are the result of a lengthy consensual negotiating process while others appear to occur spontaneously or seem common sense.

With regard to European spatial development, we can conceive of the primary normative document being the ESDP[2]. This legally non-binding code of guidelines and actions that "ought" to be carried out has no legal backing, but assumes its power via the intensive negotiating process between governments and EU institutions that preceded the adoption of the document. The broad norms of the ESDP are synthesized into *economic and social cohesion*, *conservation of natural and cultural heritage* and *balanced and effective competition across the community territory* and further operationalised as *polycentric spatial development*, *prudent management of natural and cultural heritage* and *equal accessibility to transport, communication infrastructures and knowledge* respectively.

The value added of conceiving of European spatial development as a primarily normative process is that it can aid us in determining *which* and *to whom* policy recommendations can be addressed. Also since normative research is embedded in the discipline of international relations, and in particular in the research of international

[2] The ESDP process has also be conceptualised as a "discourse" by Böhme (2003) or "ideology" by Hajer (1989). These conceptualisations obviously are close to seeing the ESDP process as a normative one. The focus on norms, however, in our definition, put more emphasis on the identity factor, that is that the ESDP proscribes and prescribes the actions that should be taken for an actor with a "European" identity.

institutions, insights can be drawn from this area that are also appropriate of the spatial planning field.

6.4 The logics of consequences and appropriateness

In an article in the special issue of International Organization, March and Olsen recap their institutional perspective as a way of thinking about the possible futures of international (or supra-national in the case of the EU) institutions. Institutions, like norms, are defined by March and Olsen (1998:948) as "a relatively stable collection of practices and rules defining appropriate behavior for specific groups of actors in specific situations. Such practices and rules are embedded in structures of meaning and schemes of interpretations that explain and legitimize particular identities and the practices and rules associated with them". The bases of action by which human behavior is interpreted are logics of consequences and appropriateness (March and Olsen 1998:949). March and Olsen ask the descriptive and problem-driven question of *when* one or the other of the logics is more likely to be observed as the basis for actual behaviour. If we can have some idea of what drives governance behaviour we can perhaps more accurately determine to whom and which policy recommendations will be appropriate.

The logic of expected consequences "sees political order as arising from negotiation among rational actors pursuing personal preferences or interests in circumstances in which there may be gains to coordinate action" (March and Olsen 1998:949). Obligations for individuals in this logic are given through consent and contracts of consequential advantage. Decisions radiating from this logic will be rationalistic and preference will be largely taken as given. Recommendations for policy actions will tend to be sectoral in nature, as the logic sees the complex political process as largely decomposable into relatively autonomous subsystems that if linked, are linked hierarchically.

The logic of appropriateness, on the other hand, is rule-based. "Human actors are imagined to follow rules that associate particular identities to particular situations… (a)ction involves evoking an identity or role and matching the obligations of that identity or role to a specific situation" (March and Olsen 1998:951). Choice within this logic is less focused on sectoral and stable interests and more focused on larger norms and identities. Those actions that validate an actor's chosen or assumed identity will be seen as the most appropriate. This logic also allows for decisions integrated among sectors and linkages among policy levels. In terms of making policy recommendations, this logic can appeal to a variety of actors involved and take up larger cross-cutting issues. For example, the norms constituting the goals of the ESDP regarding spatial development will thus guide both identities and action of actors and so policy recommendations for these norms are of essentially different character than those within the logic of consequences.

March and Olsen (1997:952) contend that the two logics are not mutually exclusive and most political and social actions will involve elements of each logic. It makes sense that in making policy recommendations it is helpful to first distinguish that both of the logics will be operating in patterning decisions and to then make recommendations accordingly. In the following sections we describe the case of potential spatial consequences for EU Enlargement and suggest two "rationales" of integrated or combined policy recommendations - one dealing with EU sectoral policy and based on "implementing" the principles of the ESDP via the logic of consequences and the other taking up integrated aspects of institutional capacity of national governments and regions from a bottom-up perspective, identity-driven process based on the logic of appropriateness. In the first case the policy recommendations are addressed to EU institutions for sectoral policies or financed by Structural and Cohesion funds, as well as the Interreg funds. We call these **Principle-based policy combinations**. In the second case policy combinations are addressed primarily to national, regional or local governments, businesses and civil society organisations and focus on the capacity to implement EU funding opportunities integrate wide reaching EU policies into development policy, thus called **Capacity-based policy combinations**.

6.5 The Case of Potential Spatial Consequences of EU Enlargement

In the *Terms of reference* for all ESPON projects, the Monitoring Committee on behalf of the EU Commission emphasizes one of the main objectives for the research:

- "to develop possible guidelines for policy responses taking the diversity of the wider EU territory in account and considering institutional, instrumental and procedural aspects" (ww.espon.lu)

Hence, in order to take the *diversity of the territory* into account each of the ESPON projects has the task of describing, analyzing and diagnosing the spatial structure of its particular research object, whether it is the demography, the transport infrastructure, the agricultural sector, the natural heritage or the spatial consequences of enlargement of the EU, or whatever. No doubt, this task is extremely demanding, particularly since the diversity of the EU territory increases dramatically as new Member States with very different characteristics are entering. Policy recommendations have to be based upon maps and typologies showing the extension of particular weaknesses and strengths as well as opportunities and risks. For a common acceptance of these maps and typologies, they have to be based on harmonized and quality proofed data covering the entire territory.

In order to consider the *institutional and procedural aspects* it is necessary to relate to the general principles of EU policy implementation, such as the subsidirity principle and involvement of active regional or local partnerships. Also this task is quite a challenge in the current process of enlargement, including the accession of countries with very different institutional structure and often – for historical reasons - still underdeveloped operational capacity at regional and local level. Hence, policy recommendations in this field have to suggest explicit procedures for capacity building at both national and regional and local levels in differing institutional and cultural contexts.

In this chapter we suggest a "methodology" for making policy "combinations" for a polycentric, sustainable, cohesive and competitive development in EU enlargement in both the near and long term future. We suggest the term policy combinations as this perhaps better describes the process of coordinating coherent policy interventions that are both multi-level, spanning the vertical levels of government and administration, and inter-sectoral, with the integration of range of traditional policy areas that better capture the territorial dimension of polycentric development. There has long been a great demand for more coherence in policy objectives and interventions.

The White Paper on European Governance (COM (2001) 428 Final) expresses that "(T)he territorial impact of Eu policies in areas such as transport, energy or environment should be addressed. These policies should form part of a coherent whole…; there is a need to avoid a logic that is too sector-specific. In the same way, decisions taken at regional and local levels should be coherent with a broader set of principles that would underpin more sustainable and balanced territorial development within the Union".

As indicated in Chapter 2, polycentric spatial development and policies to encourage such development may not always go hand in hand with the normative objectives of competitiveness at global and European scales, cohesion at national scale and conservation or sustainability concerns. The conflict of goals enumerated in Chapter 2 thus succinctly points out the need for careful combinations of policy interventions in order to promote synergy effects.

6.6 Setting the scene: Expected spatial shifts before and after enlargement

On May 1 2004, the borders to ten new Member States opened for a free flow of goods, labour, services and capital. There is little doubt 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 sectors 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 probably be affected by an increased import. This will 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 located in old industrial regions and rural regions, especially those which are close to the new external border.

This general reorientation of economic flows from East to West in Europe has already taken place during the 1990s. 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 new member states. 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 located in corridors that mainly constitute axial extensions of the "Pentagon" in EU15.

Different feedback processes, including national policy responses, will dominate the regional development in balanced or unbalanced directions: If unfettered centrifugal forces 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 centripetal forces instead dominate, a polycentric and convergent development will be the consequence, i e line with the normative objectives from ESDP mentioned in the first chapter. 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.

6.7 Risks to cope with and potentials to be developed

In summary, we identify the following categories of risks and potentials in the enlargement area of the European Union:

- Structural change of the industrial sector, involving decreasing demand for labour in deindustrializing regions and establishment of new industries in other regions
- Relocation of industrial capacity to regions with relative low costs of labour
- Outmigration from regions with high unemployment and low GDP per capita to regions with expansive economies
- Concentration of economic activities to monocentric regions, especially capitals, and to regions along the major trade and transport links
- Improving economic performance in regions with polycentric location and in spatially associated or clusters of regions
- Slow integration process in terms of flows of goods and people across borders with low permeability and with asymmetric relationships
- National policy responses counteracting negative, and reinforcing positive, consequences of the enlargement

6.8 Need for designing and prioritizing policy measures at EU level

In consequence, there is a need for designing and prioritizing integrated policy measures to cope with these risks and for developing the potential in all parts of Europe in the ongoing enlargement process.

Structural and Social Fund Policy measures for competitiveness and cohesion suggested in the Third Cohesion Report are primarily aiming at:

- Promotion of Innovations and the Knowledge economy
- Improved Accessibility
- Sustainable natural environment
- Administrative capacity
- Education, employment and social support systems

There is a demand for agreeable basis for policy recommendations along all these five items at EU level. It is a general experience that agreements among all Member States at EU level have to be based on a quantitative and comparable set of indicators covering all Member states. In this case, risks and potentials signaling specific needs are identified and mapped in all segments of the new EU25 territory and at a lowest possible geographical level. Hence, we have suggested in this report relevant typologies of regions based on available and harmonized data at NUTS3 level across EU25.

In our conceptualisation of making policy combinations we suggest a *principle-based rationale* for making policy combinations: Elementary and European-wide typology of regions at risk and with potential based on minimum data. We expect that these threats could be eased and that these strengths could be liberated by promotion of innovation systems and the knowledge economy and by improved accessibility, as suggested the Cohesion report.

However, in order to suggest efficient measures to improve administrative capacity to handle the spatial policy, we also suggest a *capacity-based rationale* for policy combinations to encourage activating bottom-up processes. Capacity-based recommendations or combinations deal with the integrated concepts of administrative or institutional capacity and cross-sectoral integration for achieving sustainable economic, social and ecological development.

6.9 Principle-based Policy combinations: Elementary and European-wide typologies of regions at risk and with potential based on minimum data.

We have developed preliminary *European-wide typologies* based on sets of quantitative indicators. The selection is based on *implicit hypotheses* on what constitutes the region's strengths and weakness in the new economic integration process. The theoretical foundations for these hypotheses are linked to fields of regional economy as economy of scale, agglomeration theory, path dependency and network theory. Empirical evidence of spatial implications registered after the previous enlargement involving new member states with considerable handicaps in terms of economic performance and income standards, i e the accession of Greece, Portugal and Spain in the 1980s, form another basis for selecting criteria for the typologies. Underpinnings are also made to the logic of consequences where preferences and interests are coordinated via the process of negotiation among rationally self-interested member states to procure coordinated and integrated spatial development policy action at the EU level. As displayed in Chapter 3, the following indicators are, or will be, employed:

- *Population*, reflecting the current size or mass of the respective administrative NUTS 3 region as such, and the regional labour supplies in relation to total regional population
- *Demographic Trends* described by the types of demographic change observed by ESPON 1.1.4.
- *Performance*, indicating the level of wealth as well as cost of labour in the region,

- *Function,* describing the region´s proximity – in travel time - to FURs described by ESPON 1.1.1. (to be included in the Final Report)
- *Converging or Diverging Economic Trends*, the historical trajectories of industrial development in the 1990s
- *Industial Specialization,* reflecting the dependance on Primary, Secondary and Tertary sectors
- *Potential Accessibility,* reflecting both the region's emerging multimodal accessibility in ESPON space and in the national context
- *Border characteristics, reflecting* the borders' importance as barriers in economic, infrastructural and cultural terms.
- *Neighbourhood or spatial association* illuminates the spillover or contiguous effects of economic growth or deprivation between adjacent regions or clusters of regions

These elementary typologies aim at a preliminary assessment of where and to which extent there appear risks for a monocentric development or potential for polycentric development at different levels. The typology should also give indications of the differential needs for coordinated policy intervention at EU, national and regional level.

In the second step – to be pursued in the final year of our project - we introduce qualitative information, describing *unique* features for regions within each typology.. We will largely compile information produced in other ESPON projects, in particular 1.1.1, 1.1.2, 1.1.4, 2.1.1, & 1.3.2 and 1.3.3 and search for complementary information on

- Cultural aspects, e g language barriers and commonalities
- Location of specialized functions
- Indicators of administrative capacity
- Existing or Planned Cooperation strategies between region
- Natural heritage
- Industrial structure and change

This leads to final assessment of where there appears potential for polycentric and sustainable development at different levels. The final assessment should also give specified indications of the spatial distribution of differential needs for coordinated or combined policy intervention at EU, national and regional level.

6.10 Capacity-based Policy Combinations: Activating Bottom-Up Processes

Policy combinations emerging under the guise of the logic of appropriateness will tend to focus on institutional learning and various types of partnerships to achieve the normative goals of the ESDP. They are complementary to those types of policy recommendations depicted in principle-based policy combinations for the logic of consequences.

Capacity-based policy combinations are thus addressed to a wider scope of governance actors as well as the cooperation, partnerships and networks developed among them for strategic problem solving. As Kohler-Koch states "The EU is… a system of "network governance" which thrives on co-ordinating a multitude of actors and approximating diverse interests" (Kohler-Koch 2002: 4). These recommendations should also address the problem coordinating policy intervention vertically across sectors and horizontally in a multi-level system of governance.

The logic of appropriateness focuses on the process of building of a common identity, in our case a common European identity, but the obvious rejoinder to assumption is that this identity is not consistently called upon. National identities are still strong and the primary motivators of economic and social policy. Many of the accession countries have been experienced drastic and frequent swings in the change of rule over the last millennium and thus identities and symbols of the nation state are more important than ever. However the drive to be included in the Union of Europe, even if initially to derive economic and developmental benefits, must be presumed to "spill-over" into at least some internalization of a greater European identity. States and regional actors then ask the questions of how a member of the EU would act in a certain circumstance. Policy recommendations or combinations should be directed towards those actions that facilitate convergence into the set of norms enumerated up by the ESDP.

These types of combinations are aimed at activating bottom-up processes.

In order to make policy combinations that stimulate bottom-up governance processes and reflect the logic on appropriateness two approaches are suggested:

- Stimulate Institutional Capacity Building at regional level
- Stimulate National and Regional Coordination of Policy sectors

These approaches are necessarily grounded in identifying and classifying current administrative capacity at national and regional levels in each country in EU10 and thus must be based on tight empirical data and useful typologies. ESPON project 1.1.3 is beginning its efforts in this area. Indicators of administrative capacity and bottom-up approaches include the regulative framework for an institution or administration, the existence of strategies and plans for implementing spatial development policies, Local Agenda 21 plans, environmental impact assessments and sustainability indicators share of expenditure allocated for the various sectors involved in spatial development, outside funding, networking and cross-border cooperation efforts. It is

useful even prior to the collection and analysis of data to consider the bottom-up approaches in more general terms.

6.11 Stimulating Institutional Capacity at regional levels

Even with a process-oriented approach to governance, institutions remain important, but rather than being seen as static variables, the governance approach seeks to understand how institutions can be transformed to increase capacity and boost efficiency for making and implementing decisions. In the case of spatial development, institutions must be able to internalize and act upon the norms developed within the ESDP in light of their identifies as "European" actors. Policy recommendations for stimulating capacity regional levels in the accession countries could include:

- Evaluating institutional frameworks
- Boosting human resources
- Creating more efficient communication mechanisms and facilitating networking

Institutional frameworks include the set up of the national, regional or local governmental and administrative apparatus utilized to take, make, implement and monitor policy decisions. These will vary considerably with regard to the efficiency in implementing the Community acquis and in allowing room for maneuver for including various forms of public-private partnerships, public participation or multi-level policy coordination. In some accession countries (such as Latvia) the regional and county administrative districts are in the process of being redrawn or amended away from the former Soviet models to better reflect "Europeanisation". This in itself produces both new possibilities, but also organizational entropy if the process is not yet complete or still ongoing.

Building capacity for *human resources* includes expanding the range of knowledge and the frames of reference to interpret knowledge regarding EU spatial development norms and policies. It also deals with increasing the hands-on interest and learning capacity of stakeholders such as citizen groups or associations for getting involved in bottom-up governance processes. In many of the former Soviet states, there is lacking a recent tradition of citizen involvement, thus introducing the challenge of mobilising a broader sphere of actors.

For creating more *efficient communication mechanisms and facilitating networking* demands that stakeholders see and react on the possibilities to achieve common actions and engage in joint problem solving. To do this there must be open communication channels to policy makers, businesses and the public and governance routines should be made more transparent. Networking within and without the EU in terms of INTERREG III funding and the new Neigbourhood Instrument should be

encouraged to a greater degree and the emphasis should be more on the non-hierarchical exchange of ideas and knowledge, rather than based on forms of clientelism between actors of differing status and power.

6.12 Stimulating national and regional capacity for coordination of policy sectors

Coordinating policy sectors to achieve the norms of the ESDP; economic and social cohesion, conservation of natural and cultural heritage and balanced and effective competition across the community territory is not a straightforward task- at the European level or at the local level. Yet with the goal to produce synergies among these norms it is necessary to create novel means of at least coordinating, if not integrating, diverse policy sectors such transport, the internal market, competition, agriculture, environment, culture, etc. This is particularly reflected in the call for sustainable economic, social and ecological development, yet the tools to integrate these areas are still few and far between. In the quest for economic growth and the levelling of economic and social disparities in the EU25, environmental concerns are usually rhetorically highlighted, but pushed to the back seat when in conflict with actual economic or social issues.

The Treaty of Union emphasizes that "Environmental protection requirements must be integrated into the definition and implementation of other Community policies" (Article 130R(2). This is a new challenge for many of the new member states. "In terms of the environment, the largest burden in the EU accession process will fall on local and regional authorities, which will have to build the environmental infrastructure required and implement the relevant legislation". (Regional Environmental Center for Central and Eastern Europe, 2004 and Beyond Strategy Paper).

As seen through the lens of the logic of consequences, coordination of policy areas, such as the integration of environmental policy into other policy areas, policy recommendations is an exercise in negotiating sectoral interests to achieve coordination, but the result may be more akin to distributional bargaining. However if appealed to through the logic of appropriateness the goal will rather be the consideration of common norms and procedures for which to begin the process of policy coordination.

This process entails initially creating a culture and a will for integrated policy making and subsequently the formal and informal administrative channels for coordination in a segmented governance system. Regions in the Western EU are perhaps advantageously placed to engage in this activity, as they are often the more operationalised and formal links between national policies and local implementation.

However many of the regions of the enlargement area are still in the process of gaining administrative legitimacy.

Developing policy recommendations for addressing coordination of policy sectors must focus largely on regional and national institutional capacity, but also point out the links and networking possibilities between higher and lower levels of governance.

6.13 Comparing the rationales for policy recommendations

Principle-based policy combinations for adapting the norms of the ESDP and the ESPON programme take a top-down governance perspective and are addressed primarily to EU institutions; the Commission, the Council of Ministers, the European Parliament and the European Court of Justice. Following the logic of consequences, policy making will thus be an exercise in negotiating well-known sectoral and national interests. The core European spatial operational goals of polycentric spatial development, prudent management of natural and cultural heritage and equal accessibility to transport, communication infrastructures and knowledge under the logic of consequences are perhaps then best formulated with regard to the accession countries as areas for Structural and Cohesion fund support, specifically those dealing with:

- Innovation and the Knowledge Economy
- Education, employment and social support systems,
- Accessibility and services of general economic interest

Capacity-based policy combinations are addressed to the EU level in that these are prime areas for Structural and Cohesion Funds including the Interreg programme funding. Yet the added dimension is that the focus should also be on building capacity for within nation states and regions, with or without EU intervention. These recommendations are directed under the logic of appropriateness towards integration of EU norms and strengthening the EU identity, and constructed around helping governmental and non-governmental actors in the accession countries achieve appropriate actions for European spatial planning governance, specifically:

- Environment /risk prevention and Cross-sectoral integration
- Reinforcing the institutional capacity of national and regional administration
- Policy responses at national and regional level

We find that both rationales, while oriented towards two very different conceptual logics, are mutually reinforcing in both the actors to which they are directed and the typologies they portray. In the theoretical argument, either the logic of consequences or the logic of appropriateness will be dominant in how policy decisions are taken.

Hansenclever, Mayer and Rittberger (1997:155-156) assert that when actors follow the logic of appropriateness they ask themselves different types of questions. Instead of asking what course of action would have best consequences in light of individual goals and preferences (as in the logic of consequences), they ask instead "What kind of situation is this?", "Who am I?" and What is the best action for me in this situation?". Those actions that validate an actor's chosen or assumed identity will be seen as the most appropriate. The norms constituting the spatial development perspective of the EU and intersubjective understandings of identity will thus guide their actions. Yet it is empirically difficult to delineate when an actor's ideas and actions are operating under one or the other of the logics and this is not the purpose of this paper. However we find that the logics of consequences and appropriateness are more useful analytical tools for orienting a framework for to whom and what type of policy recommendations can be made. See the table below for a schematic view of policy combinations.

6.14 Conclusions: Enumerating concrete recommendations for making EU spatial development recommendations

In this discussion, we implicitly assume that current and – as suggested in the Third Cohesion Report - reformed EU policies in cooperation with rational national and regional responses, will be able to cope with the – enormously demanding and unprecedented in history - task of developing a more polycentric and coherent development in Eastern Europe in harmony with Western Europe in the course of enlargement.

However, coming back to Inotai's notion on the challenges facing enlargement because of the historically rooted and largely persisting characteristics of the new member states and the current Candidate countries, i e:

- A Buffer Zone over centuries between the current Pentagon and the eastern metropolitan centers Moscow, S:t Petersburg, Kiev and Istanbul
- Economic Periphery and Peripheralization at the new external border
- Cultural and Ethnic Diversity
- Disharmonic Top-down versus Bottom-Up Development Patterns
- Risk of restrictions to full and free mobility immediately after accession
- Modernization Anchor located Outside the Region

We cannot expect that previous policies applied in EU15 will be able to meet all the needs coming from enlargement regions. There is a strong demand for innovative policy and policy innovations at all levels. This leads to our final recommendation for policy combinations:

- Allow for much more experimental or ad hoc approaches to policy design and implementation
- Build in feed-back processes and process evaluation at all levels to achieve a continuously adaptive and learning system for reaching a more polycentric, sustainable and cohesive Europe.

6.15 Policy orientations for further targeting and deepening of multi level interaction in EU regional policy

We are addressing policy orientation to all three territorial levels. At the EU level, we recognize that the Commission has identified ten themes and territorial priorities where, it argues, the EU has a justifiable role: industrial areas undergoing conversion; urban areas in difficulty; areas facing specific geographical or demographic handicaps; cross-border, transnational and interregional co-operation; social inclusion; equality of opportunity; the new economy and knowledge society; and more and better jobs.

We also recognize that the Commission has adopted a proposal of five new regulations for renewed Structural Funds and instruments. Over the period 2007-2013, these instruments present about one third of the EU budget or a total of EUR 336.1 billion. The majority of this amount will be spent in less-developed Member States and regions. Structural Funds and instruments aim to promote growth-enhancing conditions for the Union's economy and will focus on three new objectives: convergence, competitiveness and co-operation.

Our policy recommendations are fundamentally in line with the Commission's principles and priorities, and aims at further targeting and deepening of the interaction between the EU level, the nation state, the regional and local levels in designing and focusing programmes and implementation practices. The principle rationale is basically a coordinated sector approach with a top-down perspective, while the capacity rationale is territorially based and largely following a bottom-up logic.

6.15.1 Principle-based policy combinations

As for concrete and combined policy actions, we recommend

- In a long term perspective, *transport infrastructure investments* in the new member states and particularly between new and old member states are of primary importance to increase competitiveness and cohesion in the EU as a whole. Large EU transport network investment will contribute to strengthen the capital regions of new member states and thus establish a more polycentric development at the European level.

- Infrastructure developments should also stregthen the potential *Transnational Region formed by the three small Baltic countries*. Deepened cooperation with the Russian enclave Kaliningrad is important for environmental concerns. Intensified networkning with St. Petersburg and Kiev is of high prioriety.
- Polycentricity at the European level should increase by *promotion of the network of major cities in the "Triangle of Central Europe"*, with its potentially high level of integration and encompassing the area from Warsaw in the east; Poznan in the west and Budapest in the south. This Trananational Region has to strengthen its relationships with the Pentagon, the wider Baltic area, Poland and the Balkan region.
- GDP growth in major cities and city regions in the new member states does not necessarily reduce unemployment or prevent social exclusion. This calls for for *intensified and focused urban policy programmes* for more and better jobs in both capital and second tier cities.
- Promote the *multiplier effects of R&D centers*. In many of the enlargement countries universities and research centers operate in isolation from their immediate surrounding, although their findings, innovations and ideas have the potential to be implemented locally.
- Large scale infrastructure improvements alone are not sufficient for significantly reducing the economic disparities between the old and new member states; they have to be integrated with other policies of the European Union. Transport policy scenarios examined in this report are likely to accelerate the decline in polycentricity within in the new member states and accession countries, i e overpromoting capital regions. This points at the need for *policies to improve the second rank cities' functions*.. This is in line with the suggestions put forward in ESPON 1.1.1 TIR. This is a field for cooperation between all the three levels, the EU, the nation state and the regional centres. Transport investment should not be concentrated only alongside international routes. Links connecting major centers between and inside new member states are almost if the same importance. Corridors concentrating both internal and international traffic should be a priority investment.

Each new member state should be invited to draft a *national programme for regional development with emphasis on the functional growth of second tier cities.* EU funding should be provided to partnerships formed at the regional level - both to draft the plan and to secure its implementation. Small member states should profit from drafting plans in cooperation with neighbouring states. Plans should be based on analysis of the potential function and contribution to positive spatial association of the second tier cities.

Such plans should include policies aiming directly to *generate employment* in second and lower order cities and towns (cf 1.1.3 SIR):

- Decentralize government employment
- Create new public institutions

A second group of policies focuses *new transport infrastructure* on selected cities:

- Intensively develop regional highway networks focusing on major regional centres
- Route new high speed rail lines to serve selected regions
- Intensively develop local transport accessibility, including sustainable transport options such as bicycle paths linking communities and regions.

A third group of policies builds on increasing importance of culture, leisure-based tourism and sporting activities to the economies of cities and regions:

- Attract major one-off events with longer term development potential
- Deliberately develop a cultural or tourist role based on existing natural and cultural resources in regional centers or second-tier cities. Development of tourist networking possibilities (natural, cultural, historic) for cities and regions with similar experiences
- Restore historic tourist quarters

6.15.2 Capacity-based policy combinations

A final group is more general in scope and address the issue of *creating "soft" lin*ks between functional regions in order to improve polycentricity, competitions, cohesion and sustainability by facilitating the exchange of information and knowledge between regions in and bordering the enlargement area.

This report highlights the improvement of transnational cooperation/networking as important means of counterbalancing concentration in the core of the EU, especially in the case of the enlargement countries where the ability to implement spatial development goals is may be low. The INTERREG III programmes and other EU external funding sources are currently addressing these issues. In light of this, policy combinations for capacity-building could include:

Macro level policy combinations:

- Explore the use of the **Open Method of Coordination (OMC)** as a mode of governance to a greater extent in EU spatial strategies. The call for this has already been heard[3] and with the non-regulatory character of spatial

[3] For instance, A. Faludi's call for linking OMC and Spatial planning "Spatial planning for the future development in the European Union" Paris, 20-21 January 2004. ULI Land Use Policy Forum Report.

development in the EU, the flexibility, openness and plurality of actors encouraged in the OMC, this may give some legitimacy to the inherent multi-level processes of spatial development. Particularly in the Accession countries, regional and local conditions are necessary prerequisites for developing national plans to encourage polycentricity and cohesion.

- **Fortified Rural Development Policy** focusing on the enormous needs in EU's *Rustic communities.* These regions are specializing on primary agriculture, have low income levels and slow rate of structural transformation towards secondary and tertiary sectors. They are more likely to experience poor economic growth rate in the near future than other agriculture dominated regions. To meet the needs in these and other agricultural regions, EU's RDP should be broadened to focus more on *sustainable rural development* and suggest possibilities to support funding the often risk-filled attempts to switch to more environmentally-friendly methods of agricultural production. The RDR budget in old and new member states should be adjusted to the particular needs for rural development and environmental management.
- **Extended Neighbourhood policy** should be directed towards the border areas that are handicapped for integration, ie those with an already low intensity of transnational activities and low economic disparities, or those that have difficult or inaccessible borders. As the European Neighbourhood Policy and New Neighbourhood Instrument are planned to take into consideration the "new" neighbours of the European space, efforts should be focused in conjunction with the Tacis and MEDA programmes.

Meso Level Policy combinations

- The national and regional level could benefit from **capacity-building for identifying developing and monitoring EU-funded cross-border, transnational and interregional projects** in the enlargement regions. Capacity building of regional and local administrations may be necessary to empower these regions with the skills needed to recognize opportunities and suggest plans for EU-funded projects, manage programmes and evaluate results. Development of communication mechanisms and methods to promote transparency and greater stakeholder participation are also key aspects of this capacity building.

- By means of national policies, extended social policy should be developed to **secure key service provision** in Europe´s Shrinking regions to make them more attractive. The EU should provide guidelines for which services should be considered as minimum standard for service accessibility in small town Europe. 'Shrinking' communities have poor demographic structure, negative

population trends and low population mass and density, will be less attractive for private investors and qualified mobile labour than other regions. We assume that such regions are involved in a negative spiral of cumulative causation, with declining regional markets for private the sector and increasing per capita costs for public services.

- At the national level encourage programmes to **increase cooperation *within* regions of the Enlargement countries,** dependent or independent from EU-funding. In many of the Enlargement regions, efforts go into transnational or transregional cooperative schemes, but the intra-regional cooperative forums need to be highlighted as opportunities for local exchange, benchmarking and mutual learning.

Micro-level policy combinations

- **Encouraging cross-sectoral capacity implementation at, regional and local levels**. While agendas and strategies for sustainable regional development in most of the EU address the importance of cross-sectoral issues (such as climate change) there are few tools to implement these. In this respect regional/local institutional or administrative capacity may benefit by the introduction of **horizontally placed *"Development Councils***" entrusted with the job of coordinating the expected effects of policy and planning on the normative objectives of competitiveness, cohesion and conservation (or the economic, social and environmental aspects of sustainability).
- Encourage **Local Agenda 21 plans** to adapt a spatial dimension to sustainable development, for instance the importance of accessible green corridors within and close to major urban areas, bicycle paths linking major transport hubs. Local Agenda 21 plans could also emphasize the importance of seeing the natural and cultural heritage as an economic asset, in terms of developing alternative energy sources, environmental innovations or cultural tourism.
- In regions/subregions facing severe problems ("fringe", "rustic" and "shrinking" communities) there is a need for an integrated development approach, in which the main axis/focus should be a settlement/urban-oriented policy, **applying the principle of polycentrism at local scale** (ie. townships, villages, hamlets). This would include cooperating and networking in complementarities, generating some thresholds and synergies at the very local level.

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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

Third Interim Report
Part III

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Annexes:

Annex 2.1 - The "three-level approach" section of the Matera Guidance Paper

Matera Guidance Paper supports the idea to perform analyses with reference to 3 spatial levels. It reports for each one of the three levels:

Macro level (European/global)

As regards polycentric development at macro level, the dichotomy between the pentagon and the rest can be used as an indicator. Thus, the question occurs to what degree the discussed trends/developments/policies have strengthened regions containing a functional urban area with an international profile within and outside the pentagon.

Meso leve (national/transnational)

As regards polycentric development at meso level, the relation between regions having FUAs with national profile and other regions has been used as an indicator. A possible operationalisation is to assess country by country whether the dominance of the strongest functional urban area in a country has been reduced by other (inter-) national functional urban areas becoming stronger. Do the discussed trends/developments/policies have strengthened those regions and thus contributed to a more balanced development in the country?

Micro level (local/regional)

As regards polycentric development at micro level, the relations between different parts of a region are crucial. Accordingly, information provided at NUTS III level is of limited value, however, a look to local/regional functional urban areas or regions without any functional urban areas may be of help.

Annex 2.2 – Classification of FUAs per country of the enlargement area

Country	Observations
Bulgaria	Bulgaria has one MEGA, three FUAs with transnational or national significance and 27 FUAs with regional or local significance. The total number of functionally significant functional urban areas is 31.
Cyprus	Cyprus has no MEGA, but four FUAs with transnational or national significance (the total number of functionally significant functional urban areas is four).
Czech Republic	The Czech Republic has one MEGA, four FUAs with transnational or national significance and 20 FUAs with regional or local significance. The total number of functionally significant functional urban areas is 25.
Estonia	Estonia has one MEGA, one FUA with transnational or national significance and eight FUAs with regional or local significance. The total number of functionally significant functional urban areas is ten.
Hungary	Hungary has one MEGA, four FUAs with transnational or national significance and 72 FUAs with regional or local significance. The total number of functionally significant functional urban areas is 77.
Lithuania	Lithuania has one MEGA, two FUAs of transnational or national significance and five FUAs of regional or local significance. The total number of functionally significant functional urban areas is eight.

Latvia	Latvia has one MEGA, no FUAs of transnational or national significance and seven FUAs of regional or local significance, totalling eight functionally significant functional urban areas in country.
Malta	Malta has one FUA, which is classified as MEGA.
Poland	Poland has five MEGA, 14 FUAs of transnational or national significance and 29 FUAs of regional or local significance. The total number of functionally significant functional urban areas is 48.
Romania	Romania has one MEGA, nine FUAs of transnational or national significance and 49 FUAs of regional or local significance. The total number of functionally significant functional urban areas is 59.
Slovenia	Slovenia has one MEGA, one FUA of transnational or national significance and four FUAs of regional or local significance. The total number of functionally significant functional urban areas is 6.
Slovakia	Slovakia has one MEGA, six FUAs of transnational or national significance and twenty FUAs of regional or local significance. The total number of functionally significant functional urban areas is 27.

Annex 2.3: Classification of Metropolitan European Growth Areas (MEGAs)

Global nodes

Of the total 64 MEGA cities in Europe, two are considered by this study as global nodes. Europe's two global nodes, the largest and most competitive urban networks with high connectivity, are Paris and London.

European Engines[1]

The next classification of MEGA cities is European engines. These FUAs are often large, highly competitive; possess strong human capital and good accessibility. However, there can be two reasons why FUAs do not ascend to the global node level. While all the four building blocks are rated of a high European level, there is one building block that is prominently weaker than the other three. Most of these FUAs are located within the Pentagon, but a few of them are located outside. These FUAs play a key role in building a more polycentric European engine of economic growth.

Strong MEGAs

Strong MEGAs comprise cities that are relatively large, competitive and often possess strong human capital. Most MEGAs in this category have an average of building block indexes slightly below European Engines, or have one or two qualities that are notably weaker than others. In most of the cases, it is the size (population), competitiveness or accessibility of FUAs that differentiates Strong MEGAs from European engines. However, Strong MEGAs' human capital (knowledge basis) is often at the same level than with European Engines. Strong MEGAs have a very important role as relays in building polycentrism.

Potential MEGAs

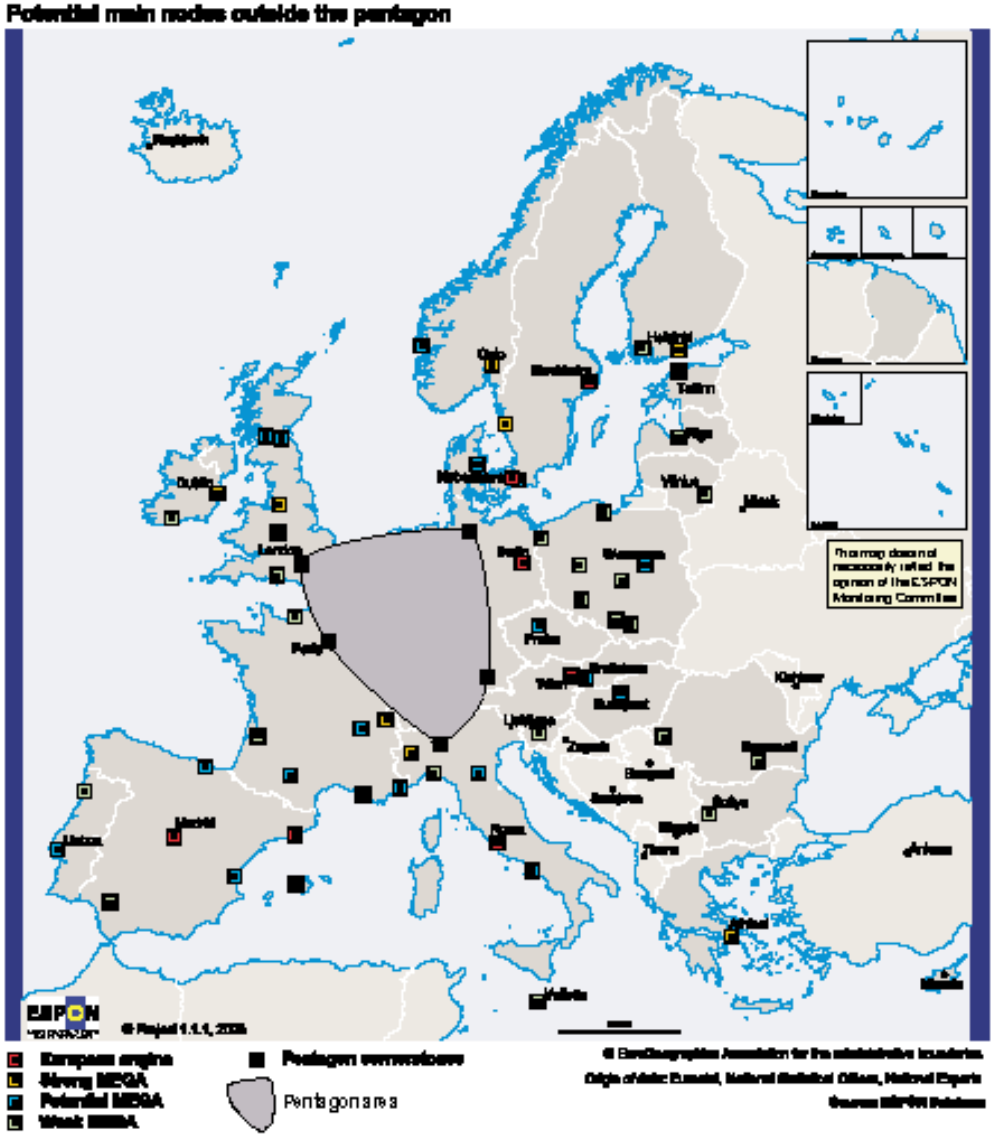
These MEGAs are smaller, have lower competitiveness, are more peripheral and often have weaker human capital than strong MEGAs. Often, potential MEGAs have one quality that is well above the other measured building block qualities. Another reason for MEGAs of this category is that the overall average of all building block qualities is rather weak. Warsaw, Budapest and Bratislava are the only MEGAs from the acceding countries that score to this category. These cities are non-capital cities of their respective countries, except in the acceding countries, Portugal and Switzerland, where Zurich is stronger. Thus, these cities play an important role in building more polycentric structures, also within their respective countries.

Weak MEGAs

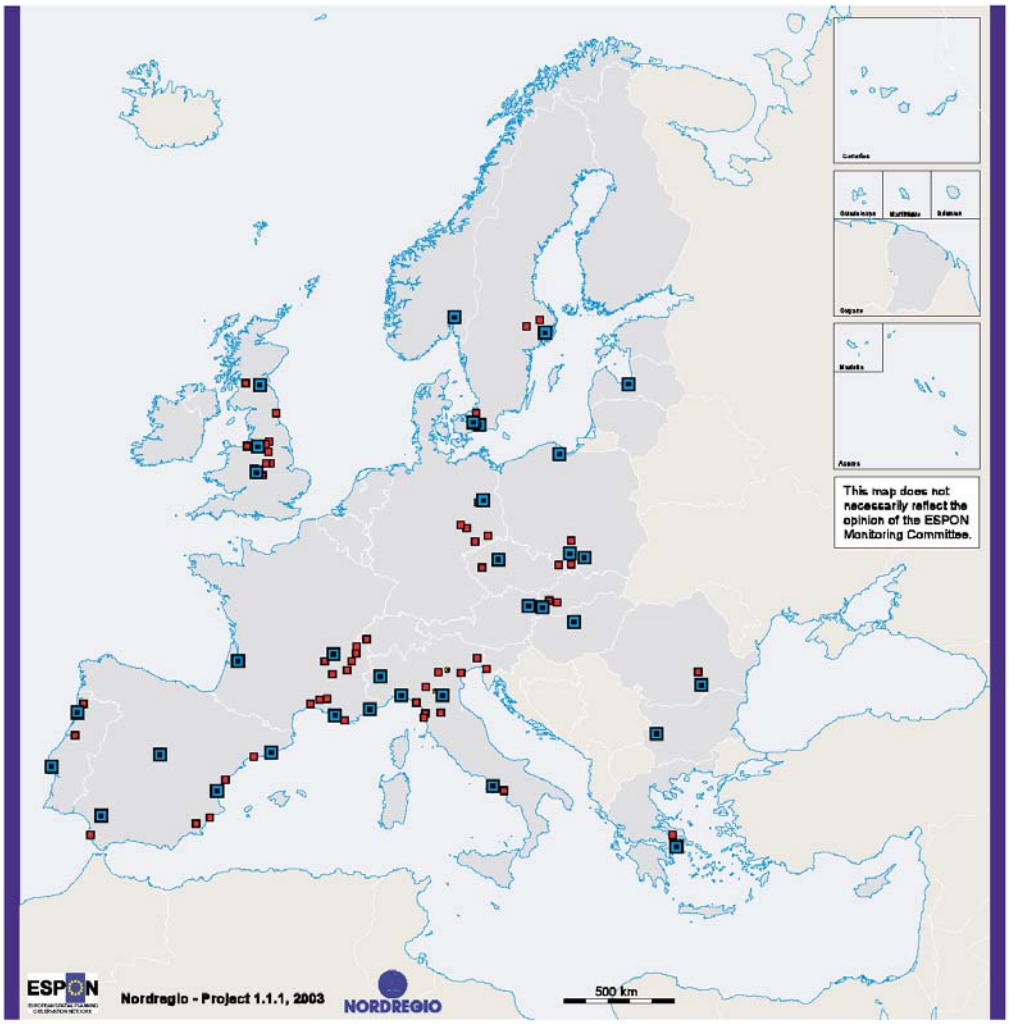
[1] See for the cities belonging to each of the following categories in ESPON 1.1.1.

These MEGAs are often smaller, less competitive, and more peripheral and have lower human capital figures than Potential MEGAs. There might be one quality that is stronger than others, but then all the other building block qualities are very weak. Another reason can be that the MEGA scores are relatively weak in all qualities overall. The development of these Weak MEGAs will depend on their capacity to overcome their weaknesses. MEGAs that belong to this category are located in the Mediterranean area, and in the acceding countries. In the acceding countries, these MEGAs are nodes to the European urban network. Their role is crucial in relaying a more balanced territorial development on the European scale.

Annex 2.4: Map of potential main nodes outside "Pentagon"



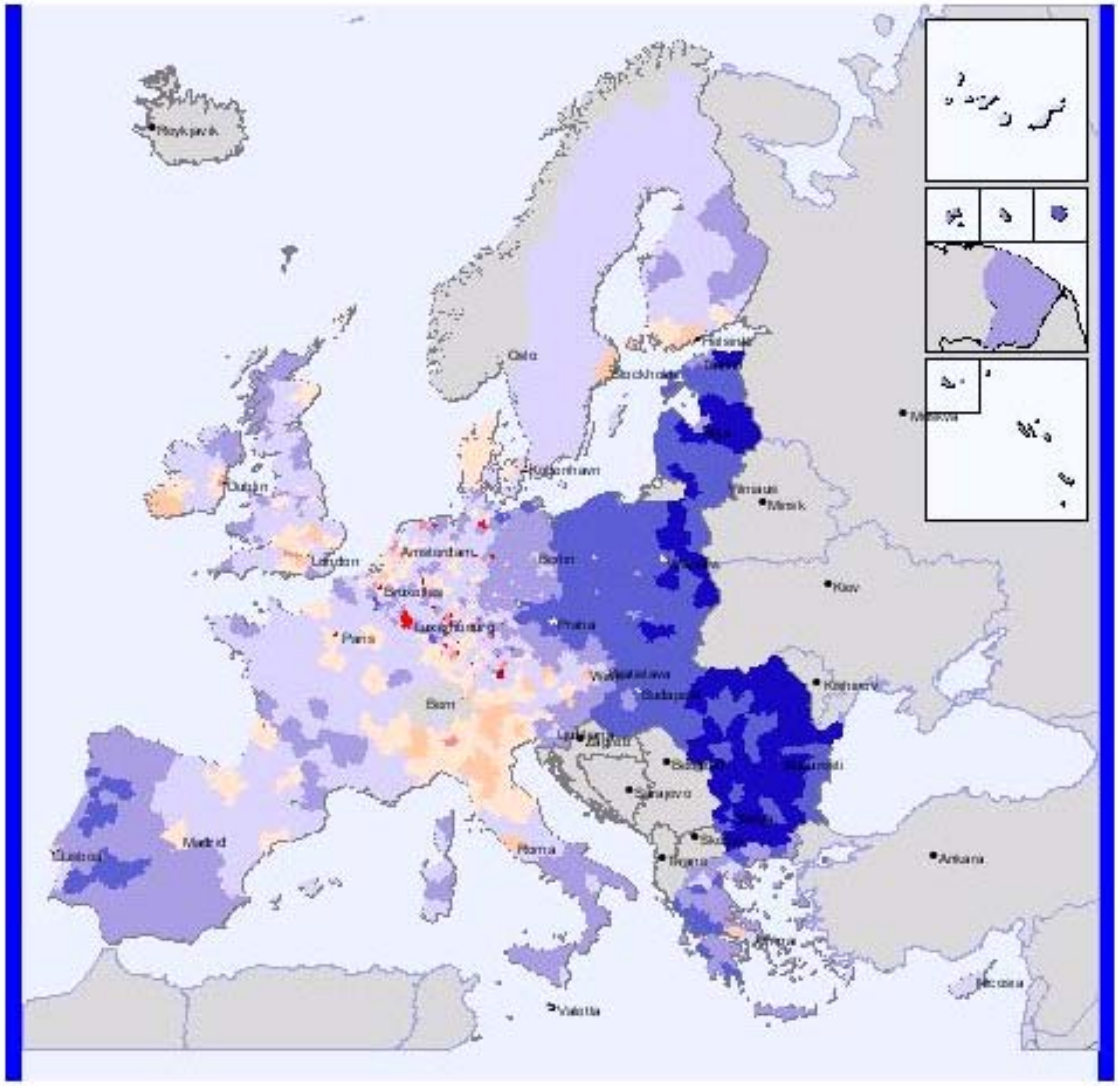
Annex 2.5: Map of The macro-region of the three small Baltic countries (Estonia, Latvia and Lithuania)



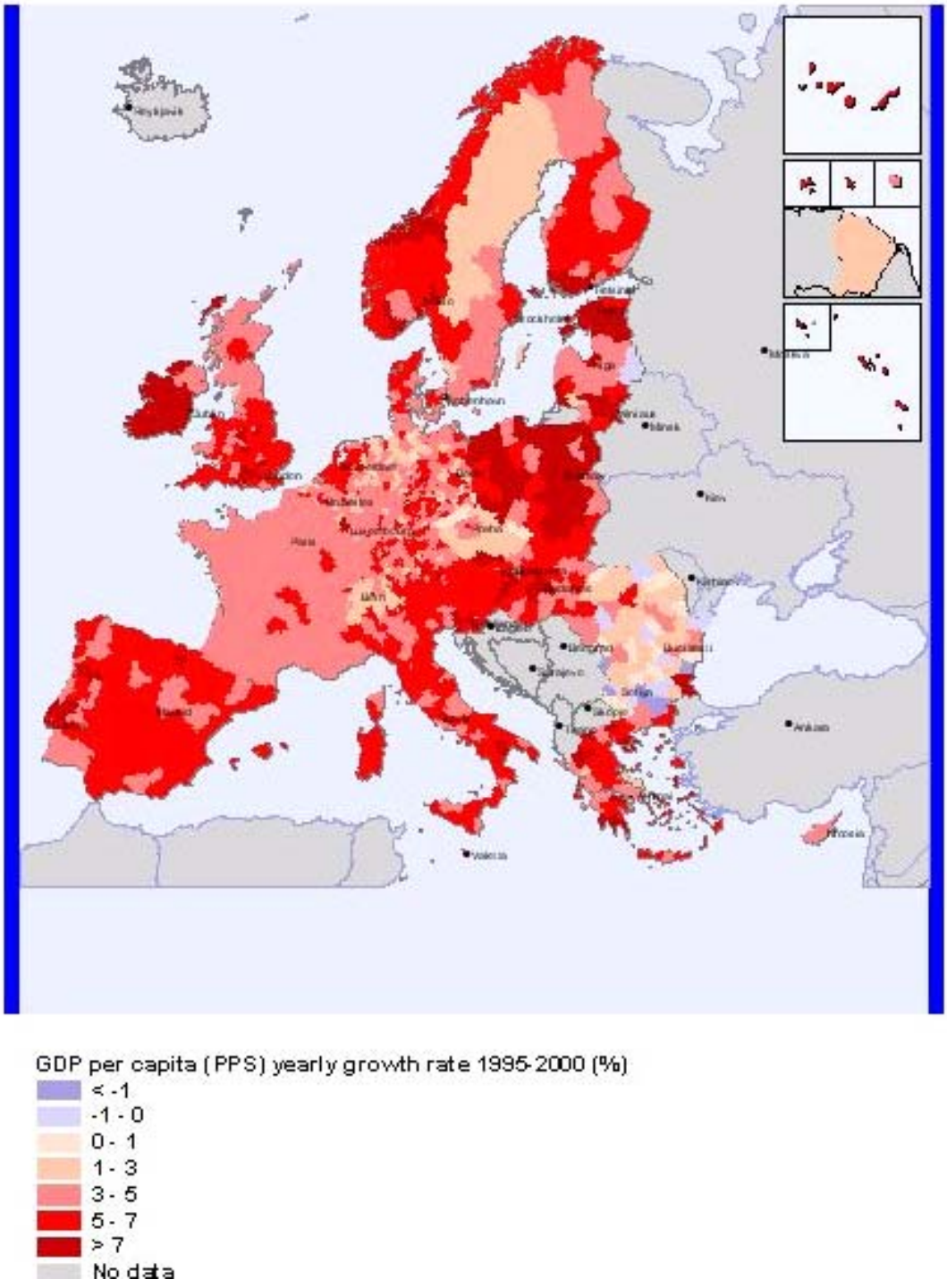
Annex 2.6: Monocentricity and polycentricity of urban systems in the enlargement countries

Rather monocentric urban systems	**Rather polycentric urban systems**
Estonia: Tallinn (Weak MEGA - 400 000 inh.) represents 29% of total population. Tartu (100 000 inh.) plays a national role. Eight other FUAs have regional or local significance. **Latvia:** Riga (Weak MEGA - 760 000 inh.) represents 32% of total population. Daugavpils (110 000inh.) plays a national role. Six other FUAs have regional or local significance. **Lithuania:** Vilnius (Weak MEGA - 540 000 inh.) represents 16% of total population. Kaunas (380 000 inh.) has a transnational/national role. One other FUA has national significance, while five other FUAs have regional or local significance **Hungary:** Budapest (Potential MEGA - 1.78 million inh.) represents 17% of total population. Eight cities (Debrecen, Miskolc, Szeged, Pécs, Győr, Nyíregyháza, Kecskemét and Székesfehérvár) with a population of 100.000 to 210.000 inhabitants have a national role and a more or less important transnational role. 68 other FUAs have regional or local significance **Slovenia:** Ljubljana (Weak MEGA - 260.000 inh.) represents 13% of the total population. Maribor (90.000 inh.) could have a significant transnational role, while four other FUAs have regional or local significance. **Malta:** the whole territory of Malta constitutes a single urban region (Weak MEGA)	**Poland:** Warsaw (Potential MEGA - 1.610.000) represents only 4 % of total population. Eleven cities, in addition to Warsaw have a population in the range of 250.000 – 800.000 inhabitants. All these cities have an important national role. Eight of them have an important transnational role (Katowice, Wroclaw, Lodz, Gdansk, Krakow, Poznan and Szczecin – Weak MEGAs), while the other three as well as some other less populated cities have a relatively less important transnational role. 36 other FUAs have regional or local significance. **Czech Republic:** Prague (potential MEGA - 1 180 000 inh.). Brno (380.000 inh.) and Ostrava (320.000 inh.) have an important national and transnational (nearly "European") role, while Plzen (170.000 inh.) and Olomouc (100.000 inh.) have a national role and a comparatively less important transnational role. 20 other FUAs with regional or local significance. **Slovak Republic:** Bratislava (Weak MEGA - 430.000 inh.) represents 8% of the total population. Kozice (240.000) has a relatively important transnational / national role, while five FUAs have national significance and twenty FUAs have regional or local significance. **Romania:** Bucharest (Weak MEGA - 1.920.000 inh.) represents 9% of the total population. Timisoara has a significant transnational role (Weak MEGA). There are, in addition to these two FUAs, twelve other FUAs with a population in the range of 150.000 – 320.000 inhabitants which have a national role and, in most cases, a more or less important transnational role. 45 other FUAs have regional or local significance. **Bulgaria:** Sofia (Weak MEGA - 1.100.000 inh.) represents 14% of the total Population. 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. 24 other FUAs have a regional or local significance. **Cyprus:** Nicosia (200.000 inh.) represents 29% of the total population. There are two other relatively important cities on the island: Limassol and Larnaka.

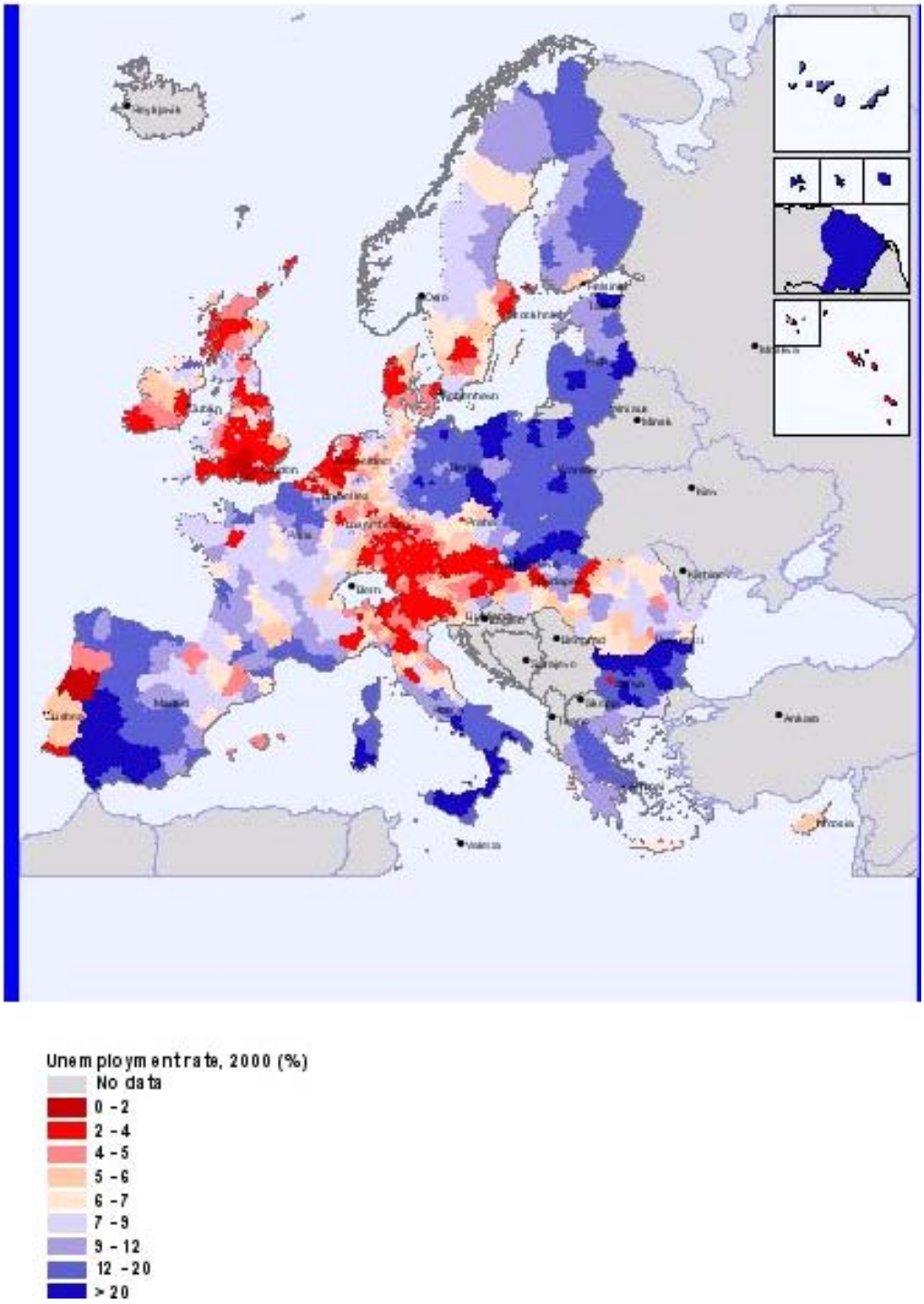
Annex 3.1: Map of GDP per capita in PPS (EU-Average=100)



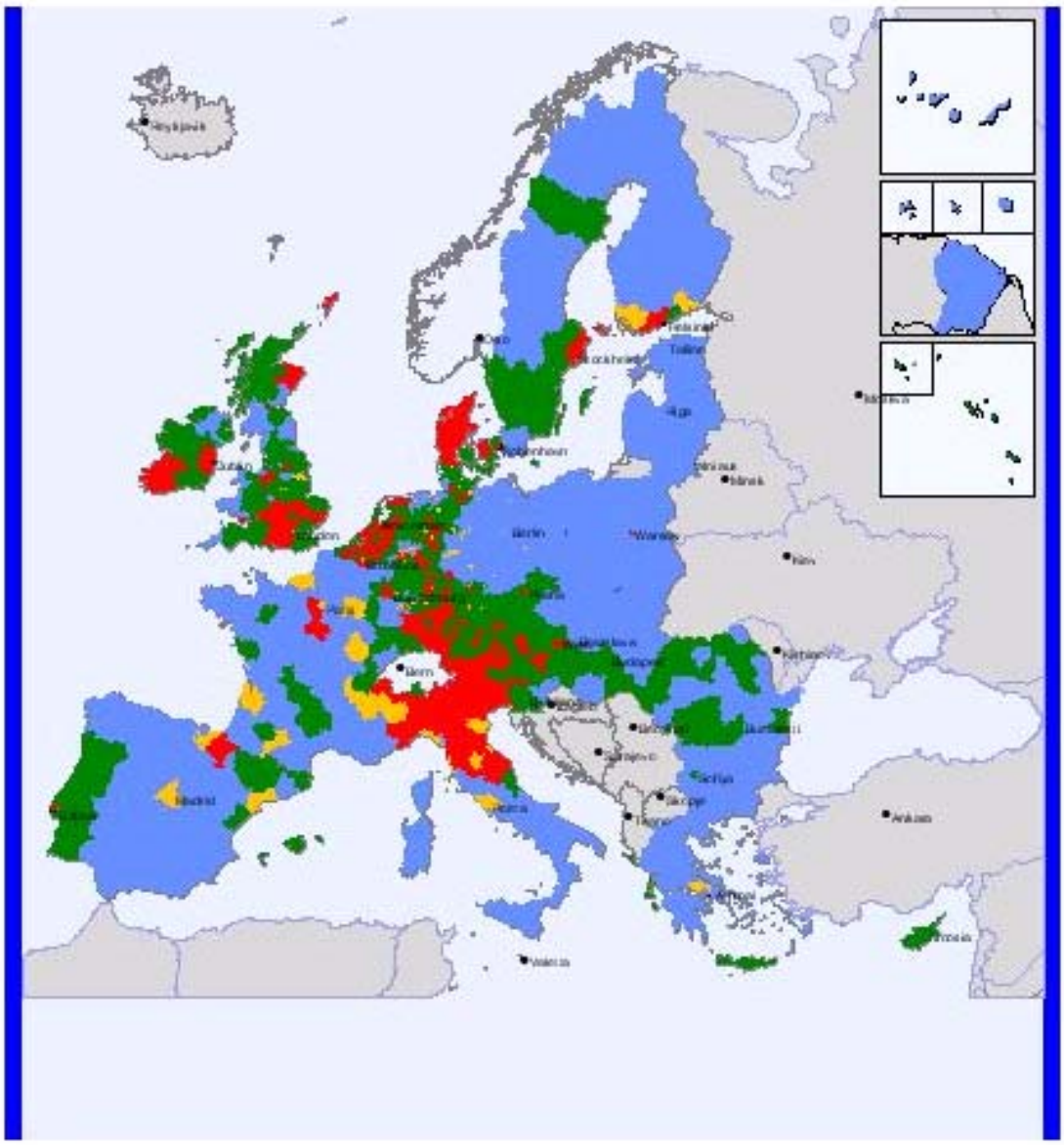
Annex 3.2: Map of GDP per capita PPS yearly growth rate 1995-2000



Annex 3.3: Map of Unemployment Rates 2000



Annex 3.4: Relation between GDP per capita and unemployment rate, 2000



Typology based on GDP per capita and unemployment rate, 2000
low GDP; high unemployment
low GDP; low unemployment
high GDP; high unemployment
high GDP; low unemployment
No data

low GDP = GDP per capita 2000 PPS below EU25 average
high GDP = GDP per capita 2000 PPS above EU25 average

Annex 4.1: NUTS Regions Attributes

NUTS Code	NUTS Region Name	Ethnic Type	Crossing Point Density	Nr of Communities	Communities Name	Typology Draft #1	Typology Draft #2
BG011	Vidin	D	2,61	2	D	2	3
BG012	Montana	D	1,07	2	D	4	3
BG013	Vratsa	D	2,74	2	D	2	3
BG021	Pleven	D	2,67	2	D	2	3
BG023	Veliko Tarnovo	D	3,19	2	D	2	3
BG025	Ruse	D	1,03	2	D	4	3
BG031	Varna			0			3
BG032	Dobrich	D	2,50	1		1	3
BG036	Silistra	D	1,62	2	D	4	3
BG042	Sofia	D	1,64	0		3	4
BG043	Blagoevgrad	S	1,43	2		4	4
BG044	Pernik	D	2,50	0		2	4
BG045	Kyustendil	D	1,67	0		4	4
BG053	Haskovo	D	2,70	1		1	4
BG055	Smolyan	D	0,00	2		4	4
BG056	Kardzhali	S	0,00	1		4	4
BG061	Burgas	D	0,63	0		3	4
BG063	Yambol	D	0,00	1		3	4
CZ031	Budejovicky	C	2,36	2		2	2
CZ032	Plzensky	D	4,00	1		2	4
CZ041	Karlovarsky	C	2,39	1		2	4
CZ042	Ustecky	C	2,86	3		2	2
CZ051	Liberecky	C	3,60	2		2	3
CZ052	Kralovehradecky	C	0,94	2		4	3
CZ053	Pardubicky	C	2,63	1		2	3
CZ062	Brnensky	C	4,33	2		2	3
CZ071	Olomoucky	C	1,06	1		3	3
CZ072	Zlinsky	D	7,48	1		1	3
CZ080	Ostravsky	D	4,37	2		1	1
EE001	Pohja-Eesti			2			3
EE004	Lääne-Eesti	D	3,23	1		1	3
EE006	Kesk-Eesti	D	5,26	1		1	3
EE007	Kirde-Eesti	S	1,67	2		4	3
EE008	Louna-Eesti	D	3,33	1		1	4
HU012	Pest	D	2,63	3	D	2	4
HU022	Komarom-Esztergom	D	2,08	2	D	2	3
HU031	Gyor-Moson-Sopron	D	2,16	4	A, D	2	3
HU032	Vas	D	2,68	3	A	1	1
HU033	Zala	D	2,47	3	A	1	1
HU041	Baranya	D	1,34	3	A, D	4	3
HU042	Somogy	D	1,35	1	A	4	3
HU051	Borsod-Abauj-Zemplen	D	1,03	4	C	3	1
HU053	Nograd	D	1,39	2		3	1
HU061	Hajdu-Bihar	D	2,27	2	C	1	4
HU063	Szabolcs-Szatmar-Bereg	D	0,84	1	C	3	4
HU071	Bacs-Kiskun	D	1,92	2	D	1	3
HU072	Bekes	D	1,76	2		3	4
HU073	Csongrad	D	1,83	1		3	3
LT001	Alytaus	D	1,01	1		3	3
LT003	Klaipedos	C	1,92	2		2	4
LT004	Marijampoles	D	2,26	1		1	4
LT005	Panevezio	D	2,30	0		1	3
LT006	Siauliu	D	2,33	1		1	3
LT007	Taurages	C	0,00	1		4	4

LT008	Telsiu	D	3,23	1		1	3
LT009	Utenos	D	2,02	1		1	3
LT00A	Vilniaus	C	1,07	1		3	3
LV001	Riga			0			3
LV002	Vidzeme	D	1,62	2		3	2
LV003	Kurzeme	D	2,22	1		1	3
LV004	Zemgale	D	2,44	2		1	3
LV005	Latgale	S	2,00	2		1	1
PL011	Jeleniogorsko-walbrzyski	C	2,29	2		2	4
PL031	Bialskopodlaski	D	1,03	1		4	4
PL032	Chelmsko-zamojski	D	0,81	1		4	4
PL041	Gorzowski	C	4,60	2		2	2
PL042	Zielonogorski	C	2,84	2		2	4
PL062	Nowosadecki	D	1,67	1		4	3
PL080	Opolski	C	1,91	1		1	3
PL092	Krosniensko-przemyski	C	0,98	2	C	4	4
PL0A1	Bialostocko-suwalski	D	1,32	1		3	3
PL0B1	Slupski			1			3
PL0B2	Gdanski			1			1
PL0B3	Gdansk-Gdynia-Sopot			1			1
PL0C5	Bielsko-bialski	D	3,70	1		2	3
PL0C6	Centralny slaski			1			3
PL0C7	Rybnicko-jastrzebski	D	3,39	1		1	3
PL0E1	Elblaski	C	0,00	1		3	4
PL0E2	Olsztynski	C	1,23	1		3	4
PL0E3	Elcki	C	0,00	1		3	4
PL0G1	Szczecinski	C	2,46	1		2	4
PL0G2	Koszalinski	C		1			3
RO012	Botosani	S	0,52	2	C	4	3
RO013	Iasi	S	1,61	0		4	3
RO015	Suceava	D	0,82	2	C	4	4
RO016	Vaslui	S	0,83	1		4	3
RO023	Constanta	D	1,30	1		3	3
RO024	Galati	S	2,50	2	D	2	4
RO025	Tulcea	D	0,00	2	D	4	3
RO032	Calarasi	D	1,23	2	D	4	3
RO034	Giurgiu	D	1,32	3	D	4	1
RO037	Teleorman	D	0,93	2	D	4	3
RO041	Dolj	D	1,88	3	D	4	3
RO043	Mehedinti	D	0,56	2	D	4	3
RO044	Olt	D	0,00	2	D	4	3
RO051	Arad	D	2,13	1		1	3
RO052	Caras-Severin	D	0,76	2	D	4	3
RO054	Timis	C	0,84	1		3	3
RO061	Bihor	D	1,82	2	C	3	3
RO064	Maramures	D	0,00	1	C	4	4
RO065	Satu Mare	D	0,60	1	C	3	4
SI001	Pomurska	D	3,00	2	A	2	4
SI002	Podravska	D	5,30	2	A	1	4
SI003	Koroska	D	2,91	2	A	1	4
SI004	Savinjska	D	2,70	2	A	1	4
SI006	Spodnjeposavska	D	1,16	2	A	4	4
SI009	Gorenjska	D	5,10	2	A	2	4
SI00A	Notranjsko-kraska	D	3,90	2	A	2	4
SI00B	Goriska	D	3,97	2	A	1	4
SI00C	Obalno-kraska	D	6,16	2	A	1	4
SI00D	Jugovzhodna Slovenija	D	1,32	2	A	3	4
SI00E	Osrednjeslovenska			1	A		4
SK010	Bratislavsky kraj	D	2,38	2	D	2	3
SK021	Trnavsky kraj	D	2,70	4	D	2	2
SK022	Trenciansky kraj	D	4,40	1		2	3
SK023	Nitriansky kraj	D	1,83	3	D	4	3
SK031	Zilinsky kraj	D	4,15	1		2	3
SK032	Banskobystricky kraj	D	1,82	3		3	1
SK041	Presovsky kraj	D	2,06	3	C	1	4
SK042	Kosicky kraj	D	1,08	3	C	3	2

Annex 4.2: NUTS Borders Attributes

NUTS Code	NUTS Region Name	Neigboring Country	Border ID	Border Type	Disparity Quotient
BG011	Vidin	CS	BG011-CS	M	1,26
BG011	Vidin	RO	BG011-RO	R	
BG012	Montana	CS	BG012-CS	M	1,26
BG012	Montana	RO	BG012-RO	R	
BG013	Vratsa	RO	BG013-RO	R	
BG021	Pleven	RO	BG021-RO	R	
BG023	Veliko Tarnovo	RO	BG023-RO	R	
BG025	Ruse	RO	BG025-RO	R	
BG032	Dobrich	RO	BG032-RO	G	
BG036	Silistra	RO	BG036-RO	R	
BG042	Sofia	CS	BG042-CS	G	2,20
BG043	Blagoevgrad	GR	BG043-GR	G	2,02
BG043	Blagoevgrad	MK	BG043-MK	M	1,55
BG044	Pernik	CS	BG044-CS	M	2,20
BG045	Kyustendil	MK	BG045-MK	M	1,55
BG045	Kyustendil	CS	BG045-CS	M	2,20
BG053	Haskovo	TR	BG053-TR	G	2,09
BG053	Haskovo	GR	BG053-GR	G	2,58
BG055	Smolyan	GR	BG055-GR	M	2,58
BG056	Kardzhali	GR	BG056-GR	M	2,58
BG061	Burgas	TR	BG061-TR	G	1,93
BG063	Yambol	TR	BG063-TR	G	1,93
CZ031	Jihocesky	AT	CZ031-AT	G	2,09
CZ031	Jihocesky	DE	CZ031-DE	M	1,86
CZ032	Plzensky	DE	CZ032-DE	M	2,06
CZ041	Karlovarsky	DE	CZ041-DE	M	1,44
CZ042	Ustecky	DE	CZ042-DE	M	1,56
CZ051	Liberecky	PL	CZ051-PL	M	1,20
CZ051	Liberecky	DE	CZ051-DE	M	
CZ052	Kralovehradecky	PL	CZ052-PL	M	1,20
CZ053	Pardubicky	PL	CZ053-PL	M	1,20
CZ062	Jihomoravsky	SK	CZ062-SK	R	1,15
CZ062	Jihomoravsky	AT	CZ062-AT	R	1,98
CZ071	Olomoucky	PL	CZ071-PL	G	1,36
CZ072	Zlinsky	SK	CZ072-SK	G	1,06
CZ080	Moravskoslezsky	SK	CZ080-SK	M	1,20
CZ080	Moravskoslezsky	PL	CZ080-PL	G	1,09
EE004	Lääne-Eesti	LV	EE004-LV	G	1,29
EE006	Kesk-Eesti	LV	EE006-LV	G	1,29
EE007	Kirde-Eesti	RU	EE007-RU	R	1,32
EE008	Lõuna-Eesti	LV	EE008-LV	G	1,29
EE008	Lõuna-Eesti	RU	EE008-RU	G	2,32
HU012	Pest	SK	HU012-SK	R	1,77
HU012	Pest	SK	HU012-SK	R	1,77
HU022	Komarom-Esztergom	SK	HU022-SK	R	1,17
HU022	Komarom-Esztergom	SK	HU022-SK	R	1,17
HU031	Gyor-Moson-Sopron	AT	HU031-AT	G	1,29
HU031	Gyor-Moson-Sopron	SK	HU031-SK	R	1,33
HU032	Vas	SI	HU032-SI	G	1,19
HU032	Vas	AT	HU032-AT	G	1,29
HU033	Zala	SI	HU033-SI	G	1,19
HU033	Zala	HR	HU033-HR	R	1,42
HU041	Baranya	HR	HU041-HR	R	1,10
HU042	Somogy	HR	HU042-HR	R	1,10

HU051	Borsod-Abauj-Zemplen	SK	HU051-SK	G	
HU053	Nograd	SK	HU053-SK	G	
HU061	Hajdu-Bihar	RO	HU061-RO	G	1,45
HU063	Szabolcs-Szatmar-Bereg	SK	HU063-SK	G	
HU063	Szabolcs-Szatmar-Bereg	UA	HU063-UA	G	2,67
HU063	Szabolcs-Szatmar-Bereg	RO	HU063-RO	G	1,45
HU071	Bacs-Kiskun	CS	HU071-CS	G	1,30
HU071	Bacs-Kiskun	HR	HU071-HR	G	
HU072	Bekes	RO	HU072-RO	G	1,49
HU073	Csongrad	RO	HU073-RO	G	1,49
HU073	Csongrad	CS	HU073-CS	G	1,30
LT001	Alytaus	BL	LT001-BL	G	1,28
LT001	Alytaus	PL	LT001-PL	G	1,24
LT003	Klaipedos	RU	LT003-RU	R	1,70
LT003	Klaipedos	LV	LT003-LV	G	1,16
LT004	Marijampoles	RU	LT004-RU	G	1,70
LT004	Marijampoles	PL	LT004-PL	G	1,24
LT005	Panevezio	LV	LT005-LV	G	1,16
LT006	Siauliu	LV	LT006-LV	G	1,16
LT007	Taurages	RU	LT007-RU	R	1,70
LT008	Telsiu	LV	LT008-LV	G	1,16
LT009	Utenos	LV	LT009-LV	G	1,16
LT009	Utenos	BL	LT009-BL	G	1,14
LT00A	Vilniaus	BL	LT00A-BL	G	1,14
LV002	Vidzeme	RU	LV002-RU	G	1,79
LV002	Vidzeme	EE	LV002-EE	G	
LV003	Kurzeme	LT	LV003-LT	G	1,16
LV004	Zemgale	LT	LV004-LT	G	1,16
LV005	Latgale	LT	LV005-LT	G	1,16
LV005	Latgale	RU	LV005-RU	G	1,79
LV005	Latgale	BL	LV005-BL	G	1,14
PL011	Jeleniogorsko-walbrzyski	CZ	PL011-CZ	M	
PL011	Jeleniogorsko-walbrzyski	CZ	PL011-CZ	M	
PL011	Jeleniogorsko-walbrzyski	DE	PL011-DE	R	1,78
PL031	Bialskopodlaski	BL	PL031-BL	R	1,07
PL031	Bialskopodlaski	UA	PL031-UA	R	1,91
PL032	Chelmsko-zamojski	UA	PL032-UA	R	1,91
PL041	Gorzowski	DE	PL041-DE	R	1,99
PL042	Zielonogorski	DE	PL042-DE	R	1,99
PL062	Nowosadecki	SK	PL062-SK	M	
PL080	Opolski	CZ	PL080-CZ	G	
PL092	Krosniensko-przemyski	UA	PL092-UA	G	1,78
PL092	Krosniensko-przemyski	SK	PL092-SK	M	
PL0A1	Bialostocko-suwalski	LT	PL0A1-LT	G	
PL0A1	Bialostocko-suwalski	LT	PL0A1-LT	G	
PL0A1	Bialostocko-suwalski	BL	PL0A1-BL	G	1,03
PL0C5	Bielsko-bialski	SK	PL0C5-SK	M	
PL0C5	Bielsko-bialski	CZ	PL0C5-CZ	M	
PL0C7	Rybnicko-jastrzebski	CZ	PL0C7-CZ	G	
PL0E1	Elblaski	RU	PL0E1-RU	G	1,38
PL0E2	Olsztynski	RU	PL0E2-RU	G	1,38
PL0E3	Elcki	RU	PL0E3-RU	G	1,38
PL0G1	Szczecinski	DE	PL0G1-DE	R	1,81
RO012	Botosani	UA	RO012-UA	G	1,44
RO012	Botosani	MD	RO012-MD	R	1,35
RO013	Iasi	MD	RO013-MD	R	1,35

RO015	Suceava	UA	RO015-UA	M	1,44
RO016	Vaslui	MD	RO016-MD	R	1,35
RO023	Constanta	BG	RO023-BG	G	1,11
RO024	Galati	MD	RO024-MD	R	1,71
RO025	Tulcea	UA	RO025-UA	R	1,01
RO032	Calarasi	BG	RO032-BG	R	1,18
RO034	Giurgiu	BG	RO034-BG	R	1,18
RO037	Teleorman	BG	RO037-BG	R	1,18
RO041	Dolj	BG	RO041-BG	R	1,16
RO043	Mehedinti	CS	RO043-CS	R	1,03
RO043	Mehedinti	BG	RO043-BG	R	1,16
RO044	Olt	BG	RO044-BG	R	1,16
RO051	Arad	HU	RO051-HU	G	
RO052	Caras-Severin	CS	RO052-CS	R	1,15
RO054	Timis	CS	RO054-CS	G	1,15
RO054	Timis	HU	RO054-HU	G	
RO061	Bihor	HU	RO061-HU	G	
RO064	Maramures	UA	RO064-UA	R	1,84
RO065	Satu Mare	HU	RO065-HU	G	
RO065	Satu Mare	UA	RO065-UA	M	1,84
SI001	Pomurska	AT	SI001-AT	G	1,43
SI001	Pomurska	HU	SI001-HU	G	
SI001	Pomurska	HR	SI001-HR	R	1,69
SI002	Podravska	AT	SI002-AT	R	1,43
SI002	Podravska	HR	SI002-HR	G	1,69
SI003	Koroska	AT	SI003-AT	G	1,43
SI003	Koroska	AT	SI003-AT	G	1,43
SI004	Savinjska	HR	SI004-HR	G	1,69
SI004	Savinjska	AT	SI004-AT	M	1,43
SI006	Spodnjeposavska	HR	SI006-HR	R	1,69
SI009	Gorenjska	AT	SI009-AT	M	1,43
SI009	Gorenjska	IT	SI009-IT	M	1,70
SI00A	Notranjsko-kraska	HR	SI00A-HR	M	1,43
SI00B	Goriska	IT	SI00B-IT	G	1,70
SI00C	Obalno-kraska	IT	SI00C-IT	G	1,70
SI00C	Obalno-kraska	HR	SI00C-HR	M	1,43
SI00D	Jugovzhodna Slovenija	HR	SI00D-HR	G	1,69
SI00E	Osrednjeslovenska	HR	SI00E-HR	G	1,43
SK010	Bratislavsky kraj	HU	SK010-HU	R	
SK010	Bratislavsky kraj	AT	SK010-AT	R	1,01
SK021	Trnavsky kraj	CZ	SK021-CZ	R	
SK021	Trnavsky kraj	AT	SK021-AT	R	2,27
SK021	Trnavsky kraj	HU	SK021-HU	R	
SK022	Trenciansky kraj	CZ	SK022-CZ	R	
SK023	Nitriansky kraj	HU	SK023-HU	R	
SK031	Zilinsky kraj	PL	SK031-PL	M	1,12
SK031	Zilinsky kraj	CZ	SK031-CZ	M	
SK032	Banskobystricky kraj	HU	SK032-HU	G	1,21
SK041	Presovsky kraj	PL	SK041-PL	M	1,29
SK041	Presovsky kraj	UA	SK041-UA	G	3,01
SK042	Kosicky kraj	UA	SK042-UA	G	3,01
SK042	Kosicky kraj	HU	SK042-HU	G	1,11

Abbreviation and Acronyms

Regional Scenario Simulations for the European Territory	RESSET
Common Agricultural Policy…….	CAP
Community of Independent States……	CIS
Eastern Europe…….	EE
European Spatial Development Perspective…….	ESDP
European Spatial Planning Observation Network…….	ESPON
First Interim Report…….	FIR
Functional Urban Areas……	FUA
Functional Urban Region…….	FUR
Gross domestic Product……	GDP
Major Urban Systems……	MUS
Metropolitan European Growth Areas…….	MEGA
Nomenclature des Unites Territoriales Statistiques……	NUTS
Open Method of Coordination…….	OMC
Purchase Parity Standard……..	PPS
Second Interim Report…….	SIR
Socio-Economic and Spatial Impacts……	SASI
Third Interim Report……	TIR
Trans European Network……..	TEN
Trans National Project Group……...	TPG
Trans-European transport network.....	TEN-T
Transnational Regions of integration……	TRI
Transnational Regions……..	TR
Transnational Urban Networks…….	TUN
Transport Infrastructure Needs Assessment…….	TINA
Urban Agglomerations…….	UA