ESPON

EUROPEAN SPATIAL PLANNING
OBSERVATION NETWORK

European Territorial Research in Progress

Conference Proceedings of the 1st ESPON Scientific Conference

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The content of this document is based on the results of applied research provided by the transnational teams of researchers taking part in the ESPON conference. As such, the maps and their corresponding texts do not necessarily reflect the opinion of the ESPON Monitoring Committee. The authors' views do not necessarily reflect the publisher's opinion.

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13-14 October 2005

The Conference was organised by ESPON in cooperation with
the University of Luxembourg,
the Association of European Schools of Planning (AESOP),
the European Council of Town Planners (ECTP),
the European Regional Science Association (ERSA),
the EUGEO, and
the Regional Studies Association (RSA)

FOREWORD

ESPON, the European Spatial Planning Observation Network, is set up to support policy development and to build a European scientific community in the field of European territorial development. The main aim is to increase the general body of knowledge on territorial structures, trends and policy impacts in an enlarged European Union. This requires also a thorough knowledge on methodologies and research approaches suitable for the tasks. The ESPON programme began its applied research activities in 2002.

After three years of intensive applied research, it was timely to reflect on the research carried out so far and begin to clarify the aim of building a European scientific research community in the field of territorial research.

For this purpose ESPON has contacted leading European academic organisations in order to jointly discuss the state of applied European territorial research and think about ways to jointly improve and promote this field.

The first ESPON Scientific Conference at the 13-14 October 2005 in Luxembourg is a result of this cooperation. This conference was organised in collaboration with the Association of European Schools of Planning (AESOP), the European Council of Town Planners (ECTP), the European Regional Science Association (ERSA), EUGEO, and the Regional Studies Association (RSA). Furthermore, the University of Luxembourg kindly provided the venue and assistance on site.

This cooperation made it possible for 130 researchers from all across Europe to meet in Luxembourg and discuss for one and a half day, the state and perspectives of European territorial research.

The conference was successful in bringing together people from different disciplines. Stimulating discussions about the findings, approaches, methodologies, and implications of applied European territorial research took place. Sincere thanks from the ESPON programme goes to all representatives from the involved scientific organisations, the University of Luxembourg, and certainly the speakers and all those who enriched the discussion with valuable inputs and reflections.

The ESPON website at www.espon.eu provides extensive information on the actual progress of the ESPON programme, giving visitors the opportunity to consult in detail individual project ESPON projects as well as the presentations given at the 1st ESPON Scientific Conference.

This report presents important papers given at the conference. Please note that the authors´ view does not necessarily reflect the publisher's opinion or the opinion of the ESPON Monitoring Committee and its members.

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INTRODUCTION

This report presents the proceedings of the 1st ESPON Scientific Conference on European Territorial Research, held at 13-14 October 2005 in Luxembourg. The conference was organised by ESPON in cooperation with the University of Luxembourg, the Association of European Schools of Planning (AESOP), the European Council of Town Planners (ECTP), the European Regional Science Association (ERSA), EUGEO, and the Regional Studies Association (RSA).

At the time of the conference ESPON moved towards the final phase of its first programming period and the first final results and more mature midterm results have been available. Thus it was an appropriate moment to call for a critical discussion on the results and to invite researchers from within and outside ESPON to discuss the state of the art in European territorial research. For this purpose ESPON has organised the conference in close cooperation with leading European research organisations and looked for a balance between presentations and participants from inside and outside ESPON. The conference was a meeting platform for different groupings of the European research community in territorial development, such as regional economy, geography, landscape architecture and spatial planning.

Thus the conference stimulated discussions between researchers from different fields and disciplines and also helped to cast new light on current research and showed many facets of European territorial research. If this dialogue can be continued in future, we may say that the conference succeeded in promoting an open and multidisciplinary scientific debate on European territorial research.

The introduction statements by Jean-Marie Halsdorf, Luxembourg Minister of Interior and responsible for territorial development, and Helga Répássy, the vice president of the national office for regional development in Hungary and member of the ESPON Monitoring Committee, addressed the necessity of a dialogue between researchers and policy-makers. Only if a common language is found in which policy-makers can explain their policy aims to researchers and researchers explain their findings to policy-makers, applied research can contribute to evidence-based policy making. Both speakers underlined that ESPON has contributed substantially to establishing a platform on which policy-makers and researchers dealing with European territorial development can meet. A continuation of these efforts as well as the joining in of other actors is wished for the future.

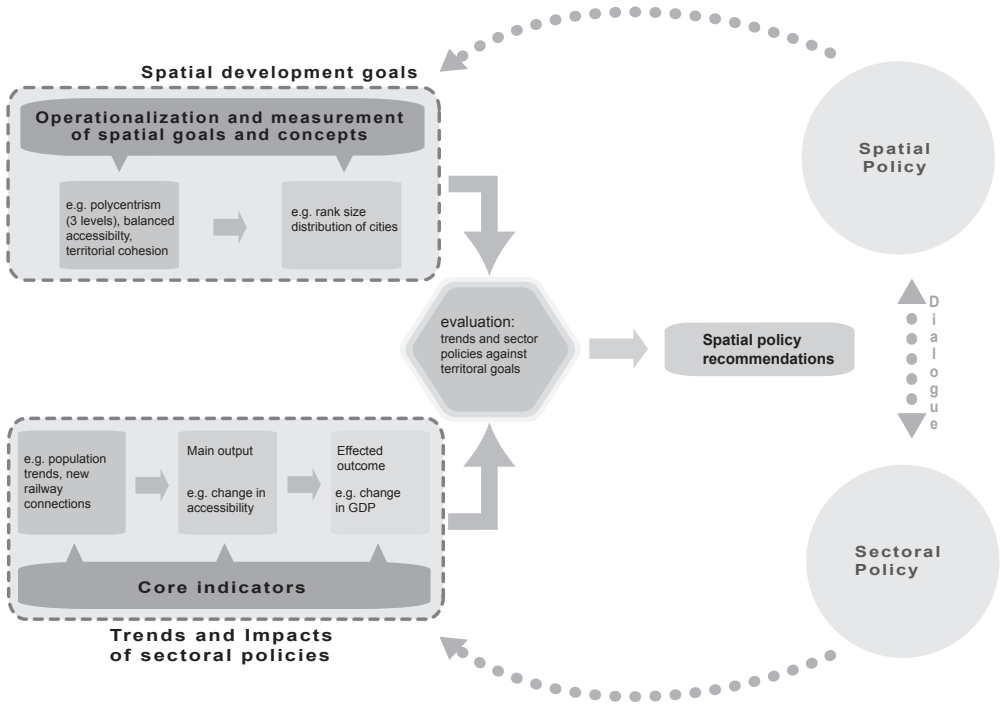
University Rector Rolf Tarrach welcomed the conference participants at the premises of the young and ambitious University of Luxembourg and underlined the necessity and importance of research.

The encouraging words that research matters, have been followed up by the introduction into ESPON and its achievements so far. Firstly, Peter Mehlbye, the director of ESPON, presented some of the major achievements made in relation to new evidence and knowledge on the territorial development of Europe and its regions. The progress made were the results of the first 15 applied research projects out of a total of 33 projects, which were carried through by ESPON between 2002 and 2005. Thereafter, Cliff Hague painted a thought provoking picture of ESPON as landmark in European territorial development, but also a landmark which still needs many refinements. Considering the very modest budget which ESPON has available for addressing its substantial task, much has been achieved with limited resources in a relatively short time. However to progress even more, Cliff Hague

invited those within and outside the first phase of ESPON to work together to build a more robust base for applied European territorial research.

In this spirit the conference was split into workshops bringing together people from within and outside ESPON around specific topics. In each workshop four scientific papers have been presented two of which based on ESPON research and two of which coming from outside ESPON. As for the ESPON presentations, it has to be acknowledged that the results presented are based on the work of a large number of researchers all across Europe.

Peter Schön provided a general introduction into the workshops presenting among others the basic methodological approach proposed for ESPON research:



Source: Crete Guidance Paper, June 2003, available at www.espon.eu
Figure 1: Basic Methodological Approach for ESPON research

The three workshops addressed the issues of European territorial typologies, territorial impact assessments of European policies and spatial analysis tools and instruments.

The workshop on European territorial typologies was based on the insight that knowledge on the territorial state of the European Union is a key element for evidence based policy making. For this reason a series of ESPON projects dealt with different aspects or sectors of territorial development and described them with indicators and typologies. The selected indicators and typologies as well as the methods behind the data collection and calculations have been crucial for the success of these projects. This workshop offered a platform for discussing some of the results and approaches taken. Based on ESPON and non-ESPON presentations different aspects

and fields of territorial development have been discussed and how these are described by indicators and typologies. The discussion highlighted methodological differences also related to the challenges of interdisciplinary approaches and research covering wider territories, e.g. the 29 countries of the ESPON space.

The workshop has been chaired by Roberto Camagni and involved four inspiring presentations. To start with Erik Gløersen presented some self-critical reflections on methodologies applied in the ESPON 1.1.1 project on polycentricity in order to establish a European typology of urban areas. Thereafter Ciarán Tracey illustrated how territorial typologies are developed and used on a smaller scale. He highlighted some practical experience on rural typologies from the Irish and local perspective. Whereas Erik Gløersen focused on typologies of settlement patterns which allow seeing the big European picture and compare functional urban areas across Europe, Ciarán Tracey focused on typologies which are developed at a geographical scale that enables practical regional and sub-regional comparisons to be made.

Philipp Schmidt-Thomé introduced another field of territorial typologies, focusing on the mapping of hazards in order to support policy decisions. He presented both findings and methodological considerations deriving from the ESPON project 1.3.1 on environmental and technological hazards, e.g. the aggregation of hazards indicators into hazard clusters and the application of vulnerability concepts. This was followed by a presentation by Sebastian Lentz presenting some reflections on the wide range of typologies used in the antropogeography for describing the space-oriented perception and action of man. Both presentations addressed in one way or the other the issue of how regions or geographical entities for analysis are created and indeed affect the result, e.g. when the geographical location of a hazard does not fit the regional division used for analysing and describing hazards.

The work on territorial impact assessment was based on the fact that territorial impacts of EU sector policies and their contradictory or reinforcing effects are important elements in the analysis of territorial development. To get deeper insights into this issue a series of ESPON projects dealt with territorial effects of a series of EU policies such as transport, agriculture, structural funds, research and development, fishery etc. Some of these assessments are taking rather quantitative approaches and some work more qualitatively, as those presented in this workshop. Furthermore, currently most of the approaches are assessing impacts ex-post. This workshop provided a platform for discussion of some approaches taken with people working on similar exercises outside the framework of ESPON. Also here methodological differences taking into account interdisciplinary approaches and European-wide analysis have been discussed.

The workshop has been chaired by Robin Thompson and gave the floor to four rather distinct presentations. Looking concretely at one European policy, Mark Shucksmith presented the findings and methodological insights deriving from the ESPON project 2.1.3 on the territorial impacts of the Common Agricultural Policy (CAP). Apart from highly interesting findings also the operationalisation of the policy aim of territorial cohesion and the assessment methodology caught a lot of interest. This was followed by a presentation of the paper on the territorial dimension of EU regional policies, prepared by Laura Polverari and Irene McMaster. Drawing on a wide range of different studies they illustrate to what degree Structural Funds are actually having a territorial dimension and showing a variation of application strategies of EU policies in different Member States. Although both

papers presented a European-wide ex-post assessment of EU policies, the methodological differences and approaches are obvious and thus illustrate different ways forward in terms of territorial impact assessments.

These presentations were followed by two presentations which focused more on the governance of territories. Joaquín Farinós Dasí presented some reflections on the ESPON project 2.3.2 on territorial governance. This project aimed at mapping territorial governance in Europe and therefore needed to establish rigours governance indicators which all allow a comparative analysis of the efforts undertaken in different parts of Europe. As governance approaches are an important means for the application of EU policies and thus affect their territorial impacts, governance is an important issue to be considered. Tim Richardson and Gordon Dabinett joined this line of argument and illustrated what European policies actually can mean to a region, yet another way to assess territorial impacts of policies. For this purpose they compare the introduction, definition and application of polycentric urban development in South Yorkshire with the analytical version coming out of ESPON research.

The workshop on spatial analysis tools and instruments addressed the issue of bringing together indicators from different areas for an integrated analysis of territorial development. For this reason a series of ESPON projects developed different methodologies and tools for integrated spatial analysis. The selection of the methodology and tool as well as the understanding of what "territorial analysis" and "territorial indicators" are, are crucial for the success of these exercises. This workshop stimulated a discussion on some results and approaches taken with people working on similar exercises outside the framework of ESPON. Certainly this meant also discussing methodological differences taking into account interdisciplinary approaches and European-wide analysis.

The workshop has been chaired by Alessandro Balducci and gave room to four stimulating presentations. Based on the work carried out by the ESPON project 2.4.2 on integrated territorial analysis, Volker Schmidt-Seiwert presented his experience with the development of a regional classification of Europe. The basic idea behind this is the generation of combined indicators for a series of thematic fields on the basis of an additive combination of single indicators. This was followed by a presentation by Attila Varga on the spatial analysis, multiregional modelling and macroeconomic performance of regions. He provided an empirical modelling framework that integrates spatial data analysis, multiregional modelling, spatial modelling of innovation and macro econometric modelling to study the regional effects of territorial developments.

Claude Grasland addressed in his presentation the issue of the suitable spatial scale and delimitation of analysis areas. For the presentation of spatial analysis tools and methods focusing on the geographical dimension of territorial cohesion he drew on approaches developed through the work in different ESPON projects, not at least project 3.4.3 on the modifiable areas unit problem (MAUP). Also Armando Montanari based his presentation on the experience from various international projects. Focusing on the issue of human mobility and migration he underlined the necessity of a thorough methodological preparation of interdisciplinary and international applied research on such complex matters.

After the workshops Jacques Robert gave a brief outlook on the future, presenting results of the ESPON project 3.2 on spatial scenarios. These scenarios are based on a synthesis of data and information collected in all ESPON projects and other transnational research efforts and try to illustrate possible and (un)desirable futures in order to deduce policy recommendations from them. This raised questions both as regards the territorial perspectives for Europe and the methodologies at hand to consider those.

Finally, Thiemo Eser provided a more concrete outlook on the future taking up the discussion on the next phase of the ESPON programme moving towards an ESPON II (2007-2013) and the continuing efforts to establish a European territorial research community. In this respect the further collaboration between ESPON and the scientific organisations which were co-organisers for this event plays an important role.

In addition to the presentations the seminar contained also a number of panel discussions which gave the involved organisations the possibility to express their views on the state of European territorial research and future collaboration in this field. Simin Davoudi spoke for the Association of European Schools of Planning (AESOP), Robin Thompson represented the European Council of Town Planners (ECTP), Roberto Camagni was on the panel for the European Regional Science Association (ERSA), EUGEO was represented by Christian Vandermotten, and Gordon Dabinett attended on behalf of the Regional Studies Association (RSA). The penal discussions showed that there is an interest, if not even a demand, for actually brining together researchers from different disciplines in order to explore European territorial development. All participants were interested in future cooperation on building up a European territorial research community and encourage also people outside ESPON to engage with the field.

All presentations from within and outside ESPON are presented in the report, apart from those by Ciarán Tracey and Sebastian Lentz. In total this report contains 15 contributions highlighting some of the different entrances towards European territorial research. Some authors draw on a wide range of research activities and provide some overall conclusions based on their experience, others report about concrete studies which have been finalised and provide methodological reflections on those, and others allow the reader insights into ongoing research projects and their approaches to and struggles with territorial European research. We also can see clearly differences between research areas where it is possible to build on previous research experience and research in areas where no comparative territorial research has been conducted so far and thus new ground is broken. All these variations lead certainly to contributions of shifting foci and quality. Taken together they illustrate the diversity of European territorial research and hopefully stimulate more interdisciplinary discussions and contributes to building a European territorial research community.

THE DEMANDS OF AN EVIDENCE BASED POLICY MAKING

Introduction note by Jean-Marie Halsdorf

Minister of the Interior and for Spatial Development, Luxembourg

Dear representatives and researchers of the Association of European Schools of Planning, European Council for Town and Country Planning, the European Regional Science Association, the European Society for Geography, the Regional Studies Association, dear representatives of ESPON project groups, the Contact Points and Monitoring Committee, dear Rector of the University Mr. Tarrach, ladies and gentlemen.

First of all I would like to heartily welcome you coming from all over the EU, the candidate countries and the neighbouring countries Norway and Switzerland to Luxembourg. I hope you had a pleasant journey to Luxembourg and settled in well.

Let me start with a provoking question! What does a politician at a scientific conference if he is not just delivering some money and wants to receive publicity in exchange? Is it at all possible that political decisions are influenced by scientific insight or does the world works by the motto – let's do business first and then some science?

I would like to use the opportunity to share with you some thoughts which clarify misunderstandings between politicians and scientist as these appear from my understanding.

My understanding of being a politician is to make a policy for people. This means in practise to built policy on evidence and a well informed fundament. For this purpose I need information and as the world becomes more complex I ask scientists to explain to me what actually is happing on the ground. From experience so far I can say that complexity even raises dealing with spatial issues – multi-causality and multi-effects and scientist have the task to recognise this complexity.

However, the art of politics is to reduce complexity and to be able to explain people in rather simple – and not simplistic – way, why things are how they are, why they should be changed and in a particular direction should the change be – in fact what policy is necessary.

The reduction of complexity is a very difficult task and requires patience from both sides, politicians have to be patient to understand the messages of the scientists but also scientists have to be patient to formulate their messages in a way politicians can understand. I dare saying that it may even not be possible to do so in a one step exercise. We may need intermediaries, which help to bridge this gap and we, I think I can speak for my minister colleagues in the EU, we see ESPON as an important stepping stone in this regard.

Let me go on with the simple statement that the government of Luxembourg appreciates very much to take part the ESPON Programme in a responsible role. This is true for several reasons:

Being a small country like Luxembourg we are - virtually by nature - interested in cross-border, transnational and European development. However the knowledge base on territorial development is rather limited. This became very obvious when

Luxembourg was heavily involved in the elaboration of the ESDP between 1997 and 1999.

How overdue the ESPON work actually is, becomes clearer, when we see in how many different contexts ESPON results are already used on the EU level ranging from the Cohesion Report to the preparation of the Community Strategic Guidelines on Cohesion: At the informal meeting on the 20-21 Mai in Luxemburg the ministers responsible for Territorial Cohesion decided to prepare a guiding document "Territorial state and perspectives of the European Union" which will built upon ESPON results.

Also some countries made already use of ESPON results preparing their development strategies, but let me briefly share with you how we, in Luxembourg, use ESPON results:

a) In Luxembourg much effort is put in strengthening the territorial dimension of sector polices. We are currently implementing a spatial development law which requires all important and spatially relevant sector policies to develop a plan with the territorial perspective in order to contribute to a coordinated approach for spatial development. This will allow us securing sustainable balance for the long term development of our country and its regions. There we can benefit from ESPON studies dealing with territorial impact analysis of sector policies, and I know that other countries do so as well.
b) ESPON results are also useful for the Sarre-Lor-Lux Greater Region (Grand region) where it is difficult to find appropriate analytical information on a comparable base. Together with our ESPON Contact Point we are currently launching an initiative to explore ESPON results for the Greater Region.

The use of results is one indicator for the success of a programme. However, I would like to stress that not only the mere need for ESPON results is the reason for the extensive use and success of ESPON results. The use is also stimulated by the new and interesting approach of research covering the whole of Europe and relating to ongoing policy debates, which as been developed by ESPON.

However, we are aware of the fact that ESPON examines new approaches in methodology due to restricted and insufficient data. This represents for me the explorative part of ESPON. But ESPON can only be successful if discussions do not stay internal and only take place between those participating in the programme. ESPON has to expose itself to the wider scientific community in order test the viability of methodologies and results. Progress can only be made if new approaches are openly discussed.

Therefore I am very happy to see the broad involvement and the collaboration of five important scientific associations. I would like to thank all those contributing to this conference, which should be the kick-off for an on-going mutual exchange.

ESPON relies on strong networking and, representing the country of the Managing Authority, I would like to stress that we jointly with our partner countries try hard to also contribute our share in providing good conditions for a successful work. I am also glad that the University of Luxembourg joins this effort by hosting this event and I am sure it will be of mutual benefit.

I may finally say that the Ministers found the common understanding at the informal meeting in Luxembourg on a future ESPON in the new Structural Funds period 2007-2013. The outcome of this conference will help shaping our mind for the development of the future ESPON and therefore also contribute to the formulation of a new programme.

Looking at the agenda of the conference and the documents, I am aware that you all are challenged by a considerable work load in combination with a tight time table. So I do not want to take more of your time as you will also listen to many presentations during the whole day. Thank you for coming to Luxembourg for this event. I hope you will have beneficial discussions that you enjoy your stay.

Thank you for your attention.

Introduction note by Helga Répássy

Dr. Helga Répássy is vice president of the National Office for Regional Development in Hungary. She is also member of the ESPON Monitoring Committee.

First of all, I should like to express my pleasure to give a presentation at this important conference as a member of the ESPON Monitoring Committe and as a national government official. I am pleased that both policy making and research are represented at this conference.

As a government official I should like to share some thoughts with you about the use of ESPON result and the need for future research in support of policy making.

Let me say that EU and national policy makers and civil servants are anxious to see scientific evidence for the guidance and support of their development of policies. Indeed, policy aims such as territorial cohesion can only be formulated and implemented with the help of supporting scientific knowledge.

Therefore findings in the field of territorial development and change are crucial for policy makers. European territorial development is still a field with a high demand for new knowledge. As spatial aspects at the European level receive more attention, research of regional trends and territorial processes are of growing importance.

At the national level there is a need to see the position of a country and region in the European context. Indeed, national governments have to include a European perspective in their territorial approach and there the ESPON results are of great importance.

In Hungary in line with the European objectives there are efforts to promote polycentric development. The development of city networks has become a major policy aim, and growth poles have been identified together with the role of small and medium sized cities. The ESPON programme has provided scientific background, and the experience grained from the participation in ESPON projects has contributed to the formulation of national development approaches. In the ESPON 2006 Programme Hungarian researchers took part in 16 teams submitting project proposals, 11 of these proposals were successful.

Experience and information derived from ESPON projects are used in various national and regional contexts in Hungary:

Project 1.1.1 'Polycentric development'[1] , Project 1.1.3[2] 'Enlargement & Polycentricity'

The outputs of the study of the European spatial structure have been used in the formulation of the general purposes related to the enhancement of Hungary's integration to the European space and to the overcoming the gap between the development levels of Hungary and the EU average. More specifically, the work on concepts such as "Competitive Metropolis: Budapest and its Metropolitan Region", regional poles of competitiveness, network of cities and the European and national

[1] The Hungarian partner in the ESPON project 1.1.1 'Polycentricity' is VÁTI, Hungarian Public Non-profit Company for Regional Development and Town Planning.

[2] The Hungarian partner in the ESPON project 1.1.3 'Enlargement and Polycentricity' is VÁTI, Hungarian Public Non-profit Company for Regional Development and Town Planning.

interpretation of polycentric development, transnational cooperation and cross-border urban regions has benefited a great deal from ESPON research..

- *Project 1.1.2 'Urban-rural'*[3]
  The delimitation of urban and rural regions has drawn from the results of the study of urban – rural relations and the characterisation of rural areas.
- *Project 1.1.4 'Demographic trends'*[4] *, Project 1.2.1 'Transport trends'*
  Demographic forecasts and the study of accessibility are important elements of the territorial analysis carried out in the support of the formulation of the new National Spatial Strategy. The aspects of demography and accessibility are fundamental elements of the delimitation of peripheral areas and of the formulation of guidelines and recommendations for the development of lagging regions, specification of territorial objectives for the development of the poles of competitiveness and city network.
- *Project 1.3.1 'Natural hazards', Project 1.3.2 'Natural heritage'*[5] *, Project 1.3.3 'Cultural heritage'*
  These projects have influenced the formulation of general aims such as sustainability and heritage management as well as the specific territorial aspects of rural areas and environmentally sensitive areas of national importance.
- *Measure 2. 'Policy Impact Projects'*
  The conclusions of the projects analysing the territorial impact of sectoral policies have been taken into account in the elaboration of recommendations for sectoral policies in Hungary, and they have influenced the overall approach of the new National Spatial Strategy, the specification of the instruments and institutional system both at the national level and at the level of the regions. Particularly essential have been the projects analysing the impact of ESDP 2.3.1 [6] and of Structural Funds, 2.2.1)

In the elaboration of a new, ESPON II Programme the experience of the practical implementation of ESPON results is taken into account. In the outline for discussion on shaping ESPON II some elements on how to relaunch ESPON have been pointed out. First, ESPON II should be more oriented towards delivering operational results for policy makers and practitioners. Second, the gaps of European wide, comparable and regionalised data experienced under ESPON I need to be sufficiently addressed in future work. Thus, ESPON II should be able to give adequate information for different European documents and policies.

In addition, there are some other aspects which need to be taken into account. Drawing on the Hungarian debate of ESPON results, I would like to emphasize the following:

- Quality control and guidance is essential also for raising the prestige of ESPON products. The contributions of the national ESPON Contact Points to the control and guidance is essential in this context.

[3] The Hungarian partner in the ESPON project 1.1.2 'Rural-urban' is VÁTI, Hungarian Public Non-profit Company for Regional Development and Town Planning.

[4] The Hungarian partner in the ESPON project 1.1.4 'Demographic Trends' is VÁTI, Hungarian Public Non-profit Company for Regional Development and Town Planning.

[5] The Hungarian partner in the ESPON project 1.1.4 'Demographic Trends' is VÁTI, Hungarian Public Non-profit Company for Regional Development and Town Planning.

[6] The Hungarian partner in the ESPON project 2.3.1 'ESDP Application' is the Centre for Regional Studies of the Hungarian Academy of Sciences.

- For the enhancement of the scientific platform we propose to set up an advisory or sounding board. Its establishment can happen through tendering as it was the case in project 3.1 of the current programme.
- The links to Interact II and Urbact II are essential, and we propose to consider links also with other EU programs.
- Interdisciplinary knowledge in the field of European territorial development is still very much needed. The cooperation of scientists of different fields such as planners, geographers, regional sciences, economists, environmental sciences etc. is a key point for success.
- I hope furthermore, that progress can be made on issues that are not sufficiently researched as yet, such as polycentric development, rural-urban partnership, territorial impacts of European and national policies as well as new spatial analysis instruments and tools.

Coming towards the end of my welcome address, I want to express my hopes that this conference will contribute to building a solid scientific platform for European applied spatial research and to bringing together researchers from different disciplines.

This interdisciplinary European dialogue is necessary for two reasons. First, science can deliver insights and evidence to political processes and thus improve the quality of our policies. Second, the quality of applied research and its use will improve the researchers´ understanding of policy making processes.

This ESPON Conference is a good start, and I hope that we can continue along this line by organising several conferences and workshops with the participation of researchers, practitioners and policy makers. As a matter of fact ESPON cannot undertake responsibility for all European territorial research, and therefore other actors in the field are encouraged to enter the dialogue. Personally, I should like to see the participation of a wide range of academic disciplines – as we have them presenting here.

Last, but not least I should like to emphasize that science needs to be client-oriented or at least user-friendly in terms of communicating the results. This involves the mutual dialogue between practitioners and scientists. Policy makers need to provide policy orientations and ask appropriate questions to generate applied research. Scientists on the other side need to present their research and findings in a language which does not exclude none scientists from the debate. Indeed, for a good dialogue between science and policy making it is utmost necessary to create a common language and understanding as well as scientific platform for applied European research on territorial development. This is the precondition for the correct use of science as evidence-base for policy making.

I wish you all a stimulating and successful conference!

ESPON AND TERRITORIAL RESEARCH AND PRACTICE IN EUROPE

by Cliff Hague

Cliff Hague was Professor of Planning and Spatial Developemnt at Heriot-Watt University in Edinburgh until 2006. He is now a freelance researcher, writer and trainer. He was involved in ESPON from 2002 as the UK ESPON Contact Point. He is a member of the Academy of the Learned Societies for the Social Sciences in the UK, and his research interests include European Planning, issues of place identity and also participatory planning.

In this contribution Cliff Hague reviews ESPON with critical eyes. He discusses its organisational structure and context as well as its research achievements. He argues that much has been achieved with limited resources and that ESPON has become a major step forward in the development of European territorial research. Despite this progress, there are still many challenges, both for ESPON as well as the wider territorial research community in Europe. His reflections on ESPON can be understood as a plea to the European research community to conduct policy-focused debates about strategies for territorial cohesion.

Introduction and Structure

This paper focuses on ESPON within the wider context of territorial research and spatial planning practice. It aims to provide constructive criticism of the early work in ESPON and to put forward ideas for how territorial research might develop. It is written by the UK ESPON Contact Point (ECP) but does not reflect the opinions of the UK nor of the ESPON Monitoring Committee.

The paper covers the following topics in sequence: 1) Origins of ESPON; 2) What has been ESPON's main approach? 3) What topics have been on ESPON's research agenda? 4) How might ESPON develop in relation to the European spatial planning practice community? 5) How might ESPON develop as a part of a European territorial research community?

The origins of ESPON

It is appropriate that this meeting is taking place in Luxembourg. Luxembourg provides the Managing Authority for ESPON and the home for the ESPON Co-ordination Unit. Luxembourg was also very instrumental in the creation of ESPON. It was the Luxembourg Presidency during 1997 that organised a Ministerial seminar on the theme of establishing ESPON. Celebrating Luxembourg's contribution is only one reason why we should spend a few moments looking backwards. *ESPON has been shaped by its origins*, and European territorial researchers should reflect on the lessons.

The definitive history of the European Spatial Development Perspective (Faludi and Waterhout, 2002) contains a description of the background to ESPON (p.166-172). Ideas for a research network to support the ESDP developed in the Committee on Spatial Development (CSD) in parallel to the work on the ESDP. Indeed, the early thinking was that the 'Observatory' would collect the information needed for the ESDP. However, it was difficult to find a suitable legal framework for ESPON that was politically acceptable. To all but devotees of EU micro-politics this is boring, but it has been important in the way that ESPON has positioned itself in relation to the European territorial research community.

ESPON was conceived as a research network that would do technical work for the ESDP and the subsequent reviews of the ESDP that were anticipated. Its research

agenda would be set by ESPON's permanent secretariat and the CSD. However, there were immediately difficulties over arrangements for the long term funding for ESPON. Essentially the problem was to find a basis on which the Commission could participate in funding ESPON. To shorten and simplify the history, the issues were about legal competence, subsidiarity, the varying enthusiasms of the Member States and the potential hostility of sector based Directorates or Ministries to the notion of spatial planning as an integrative process.

Finally it was agreed that the case for monitoring European spatial development trends was sound. As Schön (Strubelt, Gatzweiler and Kaltenbrunner 2001, Preface) observed: 'in the process leading up to the adoption of the ESDP it became obvious that, despite all the efforts, large gaps in terms of spatially relevant data and a sound knowledge of spatial processes in Europe still remain.' The route to filling these gaps was through ESPON and the funding for ESPON was through INTERREG III, with all member states as partners and the Commission playing an active role. This decision also set the maximum time span for ESPON as the INTERREG programming period 2000-2006.

Thus ESPON's was a difficult birth, which involved plenty of political negotiation. Although ESPON began work in January 2002, the Programme was not actually approved by the Commission until June of that year, and signature of the agreement by some member states was also a slow process and delayed the effective launch of ESPON in those countries. The main reason to establish ESPON was to collect and integrate national spatial data sets. Schön (Strubelt, Gatzweiler and Kaltenbrunner 2001, Preface) said that seven criteria were identified as necessary so that indicators could be developed to monitor trends in relation to ESDP objectives. These were: geographical position; economic strength; social integration; spatial integration; land use pressure; natural assets; and cultural assets.

The idea of creating a European territorial research community was a subsidiary consideration. The seventh of the 7 objectives in the ESPON CIP was 'to create a network of the scientific European community in the fragmented field of spatial development.'

This institutional history has shaped ESPON's research agenda and way of working, as did the experience with the 'test-bed' phase that preceded ESPON, the Study Programme on European Spatial Planning (SPESP).

The SPESP involved around 200 experts from the then 15 Member States, operating as a network with 13 international working groups. Each country had a national focal point, which in most cases had discretion to build a national network of experts and researchers. While the SPESP provided the core for the territorial research community that moved into the various ESPON projects, there were some significant organisational differences. The ESPON Mid-Term Evaluation (MVA, 2003, p.24) explained it as follows:

> "During the SPESP the ECP (ESPON Contact Point) network was a major component in running the study (both doing the work and managing the funds). In its current configuration the central role has gone and ECPs now operate more like satellites around ESPON, interacting with TPGs, the CU and the MC. They are largely funded from outside of ESPON."

There is always a structural tension between the commissioners of research and the research community that conducts the research. The SPESP National Focal Points / ESPON Contact Points can be seen as being, in principle, brokers intended to smooth that relationship. That brokering role, for example, might involve assisting the client to find suitable researchers, interpreting the requirements of the research client for the benefit of the team doing the research, assisting the client to understand the legitimate perspectives of the research team, and advising the client on the scientific quality of the research outputs. Since the Mid-Term Evaluation found that this brokering role had been marginalised between SPESP and ESPON, steps have been taken to strengthen the role of ECPs. Reconstruction and redefinition of that brokering role has become an increasingly large concern of the ECPs as they have moved into the final stages of ESPON I and began to anticipate an ESPON II. However, the question remains of *how best to connect ESPON to the wider territorial research community?*

ESPON was fashioned during a period when there were only 15 EU members, and when the harmonising vision of the original 6 members still provided the main political dynamo of the Union, together with a Commission that shared that vision. The end of the Cold War, Maastricht, Nice, Amsterdam, Lisbon, Gothenburg, the Single Market, the Cohesion Reports, the planned accession of new members, the Constitution… of course there were Presidencies when less progress was made, but fundamentally European spatial planning, the ESDP and its calls for the 'Europeanization' of regional and local planning were all part of this period in which integration was the leading force.

In the final months of 2005, the future direction of the European project in general, and of European spatial planning, looks less assured. The Constitution was decisively rejected in the French and Dutch referenda. There is a 'stalemate' after the election in Germany. Most member states have centre-right governments unlikely to provide instinctive support for spatial planning. Further renegotiation of the Common Agricultural Policy has been ruled out, despite the fact that this major area of EU investment has been shown by ESPON to work against territorial cohesion. The Lisbon targets are unattainable. The 1990s rhetoric that advanced the idea of European spatial planning has waned. Instead 'territorial cohesion' has come increasingly to the fore.

In summary, while the European territorial research community might be convinced of the value of territorial research at a European scale, that conviction was not shared by all the member states, or by sectoral Ministries and sectoral Directorates of the Commission even during the period when the dynamic of the EU was towards integration and harmonization. ESPON was designed by a policy elite, with the Commission playing a crucial role. Recent months have seen significant political set-backs for the vision and process through which ESPON developed.

ESPON's 'Brand': Maps, indicators and typologies

The Mid-Term Evaluation described ESPON as a 'cheap' programme that was addressing 'a substantial task' with 'a very modest budget'. ESPON projects would 'pose new questions' but there would not be enough resources to 'provide the depth of study required' (MVA, 2003, p.42). These qualifications should be considered in any assessment of what ESPON has done. If ESPON were a

supermarket it would be competing with Lidl, Aldi or Kwik-Save, not with stores like Harrods or Galleries Lafayette.

As noted above, the agenda for ESPON's research was shaped by the idea that it would *collect, analyse and map data relevant to ESDP objectives*. In the light of the history of the ESDP, the decision to put map-making at the core of the ESPON project was brave. Maps in drafts of the ESDP had proved to be very sensitive as the member states viewed them from their national interest. For example, Faludi and Waterhout (2002, p.125) told of the efforts of Sweden and Finland to have a map included that would show the number of days per year when the mean temperature exceeded 5 degrees, with its implications for the extra costs of ice breaking and road maintenance. Ultimately the ESDP was conspicuously light on analytical maps.

If the ESDP was modest in map production, ESPON has been bold (and has also produced some innovative cartography). As the second ESPON synthesis report noted, the maps presented for the first time 'information on trends and policy impacts based on indicators for all European regions' (ESPON, 2005, p.14). This is a significant contribution. The challenge now to the wider territorial research community must be to engage in analysis and debate about these findings.

A number of ESPON maps were used in the Third Cohesion Report (CEC, 2004a). This was seen as a major success for ESPON and its project teams who had been pressured to get results out quickly so that they would be ready in time to be inputs to the Cohesion Report. However, Bengs (2005) has asked some fundamental questions about the Cohesion Report and the way that its political rhetoric elides real academic analysis; 'Rhetoric that generates doubts with regard to the scientific basis of a proposition is not very convincing' (p.108). He claimed that the arguments in it are largely self-referential. Thus it is important that the territorial research community subjects ESPON findings, their interpretation and use, to critical scrutiny.

The development of *indicators* has been a central aspect of the ESPON research agenda, together with the production of typologies. This can be interpreted as reflecting the aspiration of the Commission in particular to have a standardised and robust set of measures that could be used to remove contentious decisions from the arena where member states could make special pleas. However, data deficiencies were a problem in just about every ESPON project. Even when well established statistical methods are used to combine variables there are still likely to be questions about the availability, reliability, comparability and selection of variables in the first place, and about weightings and interpretation of results.

The Mid-Term Evaluation (MVA, 2003) raised criticisms of the approach to indicators. It argued that there was inconsistency in terminology between Projects. It cited the example of the Crete Guidance Paper produced by project 3.1 'where three types of data are identified: data from official sources, core indicators calculated by TPGs and model result indicators from TPGs. In the core indicator list at the end of the paper a number of the indicators from the projects are data series such as area, population, GDP, which would normally be thought of as data from official sources rather than spatial indicators developed by a project' (p.15).

Huge data sets have been produced and interrogated and many of these are now in the public realm and can provide valuable resources for use in teaching and

research. However, there have also been times when it has felt like that theory and explanation have been sidestepped in the rush to produce tables and maps. Quantification has been prioritised over more qualitative approaches. This is not to argue that these are mutually exclusive approaches, but rather that they need to be integrated, inform each other and the approach adopted should be linked to a theoretical grounding. In general data is more likely to be available on conditions or states than on processes or even rates of change (given the problems with getting comparable time series data). Here again there is scope for interventions and commentaries from the wider research community.

The development of *typologies* has also been given a high priority in ESPON. Organising the European territory into broad categories that are not confined to any single member state is clearly a step towards understanding that territory (for researchers) and managing it (for policy-makers). However, as with indicators, the exercise depends on the data and implicitly on the purpose of the typology, which in turn begs questions about theory and interpretation. The data has dominated and the number and complexity of typologies produced has at times been bewildering. Notwithstanding this criticism the work done in Project 3.1 in developing a Regional Classification of Europe is valuable and provides a basis for further debate and development.

A key part of ESPON has been the attempt to research *the territorial impact of various EU sector policies*. This lies at the heart of the idea of spatial planning as an integrative mechanism tuned to spatial aspects of development. There were early aspirations to develop a common methodology across all these projects, so that the idea of territorial impact assessment could be consolidated and advanced. This was not achieved, as each project largely adopted it own approach. It shows some of the weaknesses in the territorial dimension of policy-making – to what extent can the territorial research community offer policy-makers a robust and replicable method for establishing territorial impacts? The lack of such a method leaves us with the default position of the field being dominated by environmental assessment, where some of the impacts are territorial but not all the territorial impacts are recognised.

The second synthesis report (ESPON, 2005) made a somewhat similar point. It promised that the lessons from the existing Priority 2 projects would be synthesised. There would be work to establish 'common minimum requirements that all assessments should include' (idem, p.15). There was also a call for ESPON to develop 'robust instruments to develop ex-ante appraisals of territorial impacts' (p.14). These are clearly matters on which there could be collaboration and debate across the territorial research community.

ESPON's Research Focus

In terms of the thematic projects, Priority 1, it is recognised that there were gaps in relation to environment and to social aspects. There are no real links for example to the Sixth Environmental Action Programme which established European policy priorities and approaches to 2010. Nor are there formal connections to the Framework Programme. It is rather ironic that ESPON, a spatial planning programme that champions integration of sectors, has had to develop as a sector-based programme.

The list of Priority 1 projects is in essence a pragmatic juxtaposition of ESDP-related topics, not unlike what might be found in a planning report of survey. The approach

has been somewhat heuristic – 'let's find out what is there and then see what it tells us'. As already explained, this was understandable. It also reflects the recognition that the territorial research community is drawn from different disciplines and traditions, a diversity that the ESPON CIP welcomed and sought to have reflected in project teams.

The result has been that the excursions into explicit theory have been uneven between different projects, both in terms of the theories addressed and the depth of treatment of the theory. Nor have the Priority 3 Integrative Projects been asked to distil the essence of an approach to key theories for the analysis of territorial trends. Demands on these project teams have been heavy, in part because they have been assigned co-ordinating roles that might have been taken on by the CU if the CU had had sufficient staff.

Nor does the synthesis (ESPON, 2005) report take us much further. There is a tantalising and carefully written section on page 9 that highlights the importance of cohesion and competitiveness. It notes that:

> "…the widespread opinion that reducing disparities is incompatible with improvements in global competitiveness, has recently been challenged at political level by Ministers responsible for spatial development. Competitiveness and cohesion factors are not necessarily considered contradictory in a territorial perspective."

Having hinted at this tension between cohesion and competitiveness, 'widespread opinion' and the Ministerial challenge to that opinion, the position of ESPON is defined as being 'presenting regionalised findings related to territorial infrastructures, trends and policy impacts within the European territory' (p.10). Of course this kind of empirical evidence is important (though again time series data, along with regional case studies would help), but from the point of view of the territorial research community it is only part of the story. There needs to be real debate about the relation between cohesion and competitiveness. That debate also needs to look beyond Europe, as the issues of competitiveness (and also cohesion) are actually global not 'just' European. The ESPON project on Europe in the World is a start in this direction, but again has a lot to do on a small budget and will largely be driven by data collection and processing.

Existing findings and on-going work within ESPON are likely to make a valuable contribution to debates about *competitiveness*. The project on Research and Development (2.1.2) includes a valuable review of the literature on innovation and its territorial aspects. The "Zoom in" project (2.4.2) has devised and mapped a composite Lisbon indicator, based on the combination of productivity, labour participation, R&D expenditures, personnel in the private sector and the educational level. Project 3.3 is a doing work on 'territorial capabilities, and has integrated Porter's (1996, 1998) work with Gothenburg concerns for sustainability.

There has also been some original work emerging from ESPON on territorial cohesion. In particular the project on Europe in the World (3.4.1) has mapped discontinuities across borders between two or more neighbouring territories, thereby developing methods to identify where the main tensions might be in terms of cohesion. In addition the Spatial Scenarios project (3.2) is developing scenarios within two axes that represent two policy priorities – competitiveness and cohesion.

At the time of writing, both of these ESPON projects are still in progress, but their initial reports promise to add significantly to our understanding of territorial cohesion. More generally though, the tendency in ESPON projects has been to see territorial cohesion simply as a measure (though again there are further limitations due to lack of comparable and reliable time series data). Though territorial cohesion has been a reference point for ESPON projects (and especially for the impact studies in Priority 2) there is no ESPON project that really has the idea of territorial cohesion as its overriding central focus. In part this reflects the origins of ESPON in the ESDP. The enhanced status given to territorial cohesion in the Third Cohesion Report (CEC 2004a) and the draft Constitution simply came too late for ESPON's first round of projects.

The Interim Report on Territorial Cohesion (CEC 2004b) defined territorial cohesion as 'the balanced distribution of human activities across the Union… it translates the goal of balanced and sustainable development assigned to the Union into territorial terms… (and) includes fair access to all citizens and economic operators to Services of General Economic Interest irrespective of the territory to which they belong.' Roberto Camagni (2005, p.125) has commented that 'The very concept of territorial cohesion still remains somehow fuzzy and deserves clarification and logical consistency'. He noted that the Third Cohesion Report refers to it as a synonym for 'more balanced development', 'territorial balance' or 'avoiding territorial imbalances (CEC 2004, p.27). He further pointed to the subsequent DG Regio 'Interim Territorial Cohesion Report' (2004), and developed the argument that territorial cohesion is 'the territorial dimension of sustainability' (p.126)… 'residing in an ordered, resource-efficient and environmental-friendly spatial distribution of human activities' (p.127). Following this line of argument, Camagni advanced three main components of territorial cohesion: territorial quality; territorial efficiency and territorial identity.

These are topics that the territorial research community must explore in depth. In particular we need to theorise the territorial forces and spatial patterns that are likely to promote territorial inclusion or exclusion. At the moment 'territorial cohesion' is usually presented as a phrase in its own right, signifying a state that can only be defined by its own antithesis (territorial balance or territorial imbalance. We need to explore the interplay of territory and power, and the territorial workings of land and property markets, and governance structures and processes.

The idea of territorial cohesion is weakly rooted intellectually in comparison with social cohesion, for example. Underpinning the concept of social cohesion there is a body of research and debates in the field of social policy. These have probed the structures that underpin social exclusion (e.g. class, gender, ethnicity, sexual orientation, the operation of labour markets, the cultural processes that reproduce stigmatisation etc. etc.), and the efficiency and effectiveness of welfare strategies (universalism or selectivity and targeting). Legal expertise and political experience has developed through the struggles to establish equal opportunities.

There are traditions in social and cultural geography that explore social segregation, conflicts over territory, and territorial identity. These are more typically focused on the urban or neighbourhood scale. However, the European territorial research community needs to conduct policy-focused debates about strategies for territorial cohesion. The changes planned for Structural Funds after 2007 provide an obvious focus.

The drift towards acceptance of territorial cohesion into the draft of the Constitution reflected the dynamic of the Delors' vision of widening the market but narrowing regional inequalities. The referendum results cast some uncertainty over this vision now. Not all member states are particularly enthusiastic about territorial cohesion. The UK government's White Paper 'Prospects for the EU in 2005' published in February 2005 discussed Structural Funds and sustainable development, but not territorial cohesion or spatial planning. Nor is there much understanding of the idea amongst the community of planning practitioners. The risk is that 'territorial cohesion' remains a concept only used by a Euro-elite, who are seen politically to be out of touch with opinion in Member States. There is a role here for the research community, but that community also needs to link to practitioners, so that the ideas are tested and communicated, not made just more esoteric and incomprehensible.

Part of ESPON's legacy from the ESDP has been a rather uncritical acceptance of the virtues of *polycentric urban development*. The ESDP claimed that 'a polycentric settlement structure across the whole territory of the EU with a graduated city-ranking must be the goal. This is an essential pre-requisite for the balanced and sustainable development of local entities and regions and for developing the real locational advantage of the EU vis-à-vis other large economic regions in the world" (pp.20-21). For reasons reviewed in the earlier part of this paper, the ESDP was produced before the research – solutions first, analysis later. The concern then is that the analysis is expected to endorse the solutions.

ESPON has worked to a pattern of analysing data at what it calls "macro" (i.e. European) scale, "meso" (transnational regions within Europe) and "micro" (national/intra-national) scales. Similarly polycentricity was projected by the ESDP to be a nested concept, a desirable aim at each and every one of these scales. However, project 1.1.1 pointed to possible conflicts between the applications of the concept at different scales. The dilemma is most marked in the newer Member States, where European scale polycentrism implies the connection and growth of their capital regions, but that process further marginalises remoter and less prosperous regions within the country. These less favoured regions also are undergoing the restructuring of traditional primary and secondary industries. ESPON Project 2.1.1 (IRR/ESPON 2.1.1, 2005) on Territorial Impact of Transport and TEN Policies, found that the degree of polycentricity of national urban systems has declined, and is likely to continue to decline.

Several ESPON Contact Points have called for a stronger critique of the polycentricity ideal within project 1.1.1 (Nordregio/ESPON 1.1.1, 2005). Indeed (Biot, 2005) and Wallet and Ritsema van Eck (2005) argued that the report of project 1.1.1 fails to make the case on which to base recommendations for more polycentricity at European level. Similarly, the ESPON project on TENs and Transport Policy questioned the notion that a single design of transport policy could optimise economic competitiveness, efficiency, environmental sustainability and balanced spatial development. Outside of ESPON there have been critiques that argued that the ESDP favoured mobility over sustainability (e.g. Richardson and Jensen, 2000). However, within ESPON there has been a tendency at times to treat polycentric development as a 'proxy' for territorial cohesion and sustainable development.

The territorial research community needs to pursue these debates, since, as the Second Interim Report of ESPON project 3.3 (University of Rome "Tor Vergata"/

ESPON 3.3, 2005) on the Lisbon-Gothenburg process observed, the implications of the 'conclusions of the ESPON projects to date are, if accepted, substantial. They suggest a need to move away from previous trajectories about competitiveness in particular. The most notable change…is a spatial repositioning, away from an association of competitiveness with the capabilities with (sic) capital cities towards a broadening of the economic base and an explicit promotion of polycentricity' (p.110).

The imprint on ESPON of Directorate structures within the Commission is also evident in the exclusion of the *urban scale* from ESPON work. After a flurry of engagement with urban issues in the late 1990s, the Commission has tended to step back, and the logic of the rejection of the Constitution would seem to make it unlikely that there will be new advances towards a stronger EU urban focus. Similarly, the urban environment is clearly the preserve of DG Environment, not DG Regio. However, the Communication *Towards a Thematic Strategy on the Urban Environment* (CEC 2004c) promotes the development of an integrated approach to the urban environment, not only within levels of government but between them.

The deflection of attention in ESPON away from the urban scale has a number of implications. It risks obscuring inter- and intra- urban divisions because data is averaged at a coarser spatial scale. In terms of physical development and infrastructure this matters in particular because of the trends towards the 'unbundling' of the legacy of comprehensive publicly provided infrastructure networks, in favour of private provision and consumer choice e.g. through creating new premium services, while also creating transnational connectivity to serve a globalised market. In this emerging world, place competitiveness seems likely to be defined by maximum infrastructure capabilities, lowest costs, maximum flexibility and potential mobility.

This process of local unbundling combined with international integration makes places, as traditionally conceived and managed, less and less the real containers of economic activity. They are superseded by networks operated by private companies dependent on the financial sector. The imperatives of competition force these firms to invent ways to add value to their product by offering the capacity to bypass the congestion and spaces of general user linkages. The ESPON project that has most engaged with this new world has been that on Telecommunications (CURDS/ESPON 1.2.2, 2005), and it is no coincidence that this was a project where the difficulties of accessing data were immense, since much of the key data is held by private companies and deemed to be commercially confidential. There is a risk that ESPON is doing a great job in mapping the geographical legacy of the nineteenth and twentieth centuries across European space, but is ignoring the drivers of 21st century territorial change.

In summary, systems of categorisation such as urban hierarchies have been given more attention over the study of processes that drive urban change. Similarly the rhetoric of the ESDP about polycentric development, the evils of 'urban sprawl' and the potential for new urban-rural relations have been reproduced but we do not have a rigorous assessment of the case for urban containment. Property markets and urban congestion are important influences on cohesion and competitiveness, and also issues where spatial planning practice at regional land local scales is very important. However, these concerns have not received much attention in ESPON. This perpetuates the divide between ESPON as a European research programme

and the communities of spatial planning practitioners in the different member states. Most planners work at urban or neighbourhood level but ESPON is European and regional.

ESPON and the European spatial planning practice community

> "For policy makers and practitioners, in different policy sectors and at different administrative levels looking at ESPON maps, the challenge is to extract the larger territorial context and get inspiration for including a territorial dimension in further policy development." (ESPON 2005, p.14)

The evidence from the *ESPON Going Regional* ECP Networking Activities staged in Belfast and London in 2005, is that practitioners are relatively unaware of ESPON findings so far, and even when actively engaged on a spatial planning task, in general they have not been explicitly using ESPON to set their territorial context. One possible reason for this is the relatively *limited role of policy analysis* in ESPON.

ESPON has sought policy recommendations from the teams carrying out the projects, but somehow policy analysis has not been central to the projects. Indicators and typologies have almost been ends in themselves – the essential background information that DG Regio needs. There has been an implicit separation of 'science' and 'policy' in the way ESPON has developed. This is understandable given the practical politics and relatively weak position of spatial planning. However, it exposes another area where there is scope for a positive interaction between ESPON and the wider research community.

The *modus operandi* of most ESPON projects have been closer to traditional geographical research than to spatial planning contract research or to academic policy analysis. There needs to be dialogue about the aims of territorial policy, interpretation of those aims and their translation in objectives and actions, conflicting priorities, the territorial and other factors that mediate the implementation of policy. It is understandable if the policy recommendations sections of ESPON reports seem to have been written in a rush, against demanding deadlines, and to have fallen short of a fully considered assessment of the implications of findings for policy. This does not preclude such debates taking place within the wider research and practice community.

It seems unlikely that ESPON's project on governance will be able to grapple in depth with the policy-making process, especially given its adherence to the need to produce swathes of indicators etc. Hopefully as the hurdles of data collection are overcome, there will be scope for work in ESPON that is more focused on understanding process and the centrality of issues of governance to the territorial policy field. Such a shift would be liken to strengthen dialogues with the practitioner community too – provided the work is informed by practice and does not sink into the kind of meta-language beloved of academics and despised by practitioners.

There is a real need to forge better connections between the research community and *INTERREG projects*. Many INTERREG projects are dealing with issues that in principle overlap with ESPON themes. This should be no surprise, given their common relation to the ESDP. However, so far few such projects seem to have made explicit use of ESPON. The relationship between ESPON and spatial planning

practice should be two way. The statement quoted at the head of this section implies a one-way relation, with practice taking and using ESPON findings. However, ESPON could also learn from INTERREG projects which in principle could be the action research arm of ESPON. At present there is a lot of innovation and even potential data generation going on within INTERREG projects, but little of it seems to be reflected in ESPON reports.

Part of the difficulty of connecting ESPON and spatial planning practice has been that following the experience in the SPESP, ESPON was at best hesitant about the value of *case studies*. One consequence is that in general case studies have been hidden away in the Annexes of ESPON reports, and too often have confirmed fears that case studies are descriptive, anecdotal and inadequately rooted in testing, extending and deepening the robustness of typologies. However, it is precisely at the regional case study level where connections can be made most easily with policy-makers and practitioners. There is scope to get 'the best of both worlds' by using regional case studies in a systematic and in-depth manner that is informed by ESPON findings, tests those findings and delivers new practices and results. Co-operation between the territorial research community within a region, spatial planning practice in the region and ESPON through a carefully chosen and mutually supported network of 'ESPON laboratory regions' could create new synergies in ESPON II after 2006.

Conclusions: ESPON and a European Territorial Research Agenda

ESPON is a landmark in the development of European territorial research. There are still many refinements to be made, not least in terms of the availability of reliable and comparable data, and therefore all results need to be handled with caution. Much has been achieved with limited resources in a relatively short time. This paper has taken most of these positive outcomes for granted, and has concentrated instead on trying to probe gaps and to challenge presumptions. The aim has been to invite those within and outside the first phase of ESPON to work together to build a more robust base for the analysis of the territorial dimensions of policy making and implementation.

In looking towards an agenda for European territorial research the main propositions advanced in the paper have been:

- The case for European territorial research has been advanced by a policy elite, and in particular by DG Regio. That case has been contested and may be further contested if the 1990s momentum towards European integration is lost following changes in the political climate within the expanded Union of 2005.
- The 'brokering' relationship between the commissioners of European territorial research and those undertaking that research is unresolved. In general clients want findings that are comprehensible in policy terms and sufficiently well grounded as to provide an assured basis for policy making. Researchers are likely to want to follow their academic interests and to qualify their results.
- The main outputs from ESPON have been those most sought by the Commission, e.g. for use in the Third Cohesion Report. These have been indicators, maps and typologies.

- More work is needed to synthesise the findings from the projects dealing with territorial impact methodologies, including the development of methods for undertaking *ex ante* assessments.
- The territorial research community needs to develop a critical understanding of the notion of territorial cohesion, exploring the processes that contribute to cohesion or undermine it, and testing political rhetoric that presumes that the relations between cohesion and competition are unproblematic.
- Similarly, the benefits from polycentric urban development have been assumed rather than proven in ESPON projects. The research and practice communities need to debate the evidence and underlying theory.
- Links need to be built to connect ESPON research to research on European environmental issues, urban scale research and work on governance and processes of territorial change, including land and property markets.
- There is a strong case for two-way links between ESPON and work being done in INTERREG projects.
- A system of 'laboratory regions' could help build new synergies between ESPON, the wider territorial research community and spatial planning practice.

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EUROPEAN TERRITORIAL TYPOLOGIES

A FIRST STEP TOWARDS AN IMPROVED UNDERSTANDING OF URBAN PROFILES AND POLYCENTRIC DEVELOPMENT POTENTIALS

by Erik Gløersen

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The ESPON project 1.1.1 on polycentricity set out to analyse the European urban system. The analysis of functional urban areas broke new ground through its geographical scope and the number of urban areas taken into account. Erik Gløersen provides some self critical reflections on the work of the project and emphasises that the focus of the polycentricity debate should be on functional specialisation of cities. He furthermore presents some methods which could be applied in further research on polycentric urban development taking forward the work of the ESPON project.

Introduction

Polycentricity is acknowledged as a central objective for spatial planning in Europe. As has been shown by Davoudi (2003) this however does not imply that a consensus has been reach when it comes to the meaning of the concept. Analyses related to the polycentric development of the European territory therefore first need to identify their understanding of the concept.

When Nordregio was awarded the role of lead partner for the study on *"The Role, Specific Situation and Potentials of Urban Areas as Nodes in Polycentric Development"* (also known as *"ESPON project 1.1.1"*), the main reference was the European Spatial Development Perspective (ESDP) approach of polycentricity. This led to the adoption of three main scales of analysis: At the European macro scale, the ESDP encourages the identification of *"several larger zones of global economic integration in the EU"* which can be promoted as potential strongholds for a continental polycentric territorial organisation. At the transnational and inter-regional scale (or meso scale), the focus is on how to encourage the emergence of *"a polycentric and more balanced system of metropolitan regions, city clusters and city network"*. Finally at the intra-regional micro scale, the project looked at *"integrated spatial development strategies for city clusters in all Member States, within the framework of transnational and crossborder co-operation, including corresponding rural areas and their small cities and towns"* (CEC, 1999, p. 21).

The reference to the ESDP implies that polycentricity should be interpreted in a multiscalar perspective, because urban nodes play different roles at different scales. There can be contradictions between the policy objectives at different scales. One may for example facilitate polycentric development at macro scale by asserting a metropolitan region's role in a global integration zone (GIZ). But this can require a concentration of resources to this region at the expense of secondary cities, leading to more monocentric patterns at the meso scale. One objective of polycentric territorial policies is balance territorial objectives at different scales.

The general objective of the present article is to describe how the analyses undertaken within ESPON 1.1.1 has lead us to question the ESDP understanding of polycentricity, which served as an initial hypothesis and guided methodological choices. The first section critically analyses the way in which urban areas were conceptualised and delimited in ESPON 1.1.1. The second section argues that, by focusing mainly on rank, the statistical methods used for the FUA analysis in ESPON

1.1.1 fail to account for functional specialisations in secondary urban nodes, and thereby gives an incomplete account of potentials for polycentric development in Europe. The final section presents some alternative methods, susceptible of providing a more nuanced view of the roles and functions of cities at different levels in the urban hierarchy.

Conceptualising urban areas

The major endeavour of ESPON project 1.1.1 was to characterise and classify cities in Europe. Cities were approached in terms of Functional Urban Areas (FUAs), corresponding to travel-to-work areas around each urban node.

This first implies that the city was conceptualised as a daily-life living environment rather than as an administrative territory or a continuous built-up area. The administrative boundaries of the city indeed seldom correspond to its functional area. Administrative boundaries may be relevant insofar as they reflect a spatial context for urban government and governance. It is however difficult to distinguish the relative importance of municipalities, inter-municipal cooperation bodies and regional authorities in this respect. Urban government and governance areas are therefore difficult to delimit in a comparable way. A European typology of cities based on administrative entities would furthermore be most likely to reflect the institutional organisation in each member state rather than the territorial structures.

Contrary to administrative entities, continuous built-up areas have been used in a number of international comparative studies of cities (see for example Moriconi-Ebrard, 1994 and Rozenblat and Cicille, 2003). These latter authors invoke the greater comparability of built-up areas across Europe, as compared to functional urban areas. An approach based on built-up areas however neglects the fact that the urban realm extends far beyond the continuously built-up area. A large and increasing proportion of the population is composed of persons whose daily life is directly connected to an urban context, even if their dwelling may be situated in a suburban or even rural area. Circumscribing the city to the continuous built-up area therefore does not make sense from a social and economic point of view.

An underlying hypothesis of the FUA approach is that the boundaries of the travel-to-work areas correspond to a possible delimitation of each urban economic region, i.e. that certain types of interaction between economic actors are directly or indirectly connected to daily commuting patterns. This is not obvious, as one can for example hypothesise the existence of wider commercial functional interaction areas, e.g. for industrial clusters, sub-contracting relationships, etc. Further empirical evidence needs to be gathered on this issue.

Selecting and delimiting relevant urban nodes

As the project could not consider all European cities and towns, a selection was carried out. Cities were analysed insofar as they had an urban core population exceeding 15 000 and a total FUA population which either exceeded 50 000 inhabitants or 0,5% of the national population. In addition, some smaller cities of particular functional importance were also considered (Antikainen, 2005). By applying these criteria, a list of 1595 relevant FUAs was established.

This selection is problematic in different respects. As pointed out by Antikainen (2005), the FUA definitions that have been applied are very different from country

to country. Nine ESPON countries have no definition of FUAs whatsoever; in these cases it was necessary to rely on expert advice for the delimitation. The spatial entities considered are therefore not entirely comparable. In the case of Poland for example, the areas considered were significantly larger than in other countries. The FUAs of major nodes would therefore in many cases encompass surrounding secondary nodes, which in other countries would have been considered as a separate FUA. Belgium, on the other hand, had no definition of FUAs. When identifying approximate urban commuting areas, the cities of La Louvière, Leuven, Aalst, Namur and Mons were considered as separate entities. From a European perspective, it could however seem more coherent to include these cities in the Brussels FUA as had previously been done by the GEMACA II study (IAURIF, 2002). By way of consequence, the relative weight of Brussels was underestimated in comparison with other European Metropolises. On the other hand, the distinction of the different cities can seem relevant from a regional or national perspective, insofar as the development paths of these cities within the Brussels metropolis are different.

As illustrated by these examples, it would not have been possible to reflect the functional territorial context of each city truthfully even if we had applied a hypothetical homogenous FUA delimitation method throughout Europe. Different scales of analysis and territorial contexts require different approaches. It is furthermore often impossible to combine the regional and the European functional perspectives in a single delimitation, as illustrated by the Belgian example.

The cartography of FUA delimitations is unfortunately not available in most ESPON countries. Taking the example of the Nordic countries, for which these limits have been compiled (Figure 1), one sees that the FUAs in some cases cover the national territory almost entirely (e.g. Denmark), or large proportions of national sub-entities (e.g. Southern and coastal Sweden, South-Eastern Norway and Finland). Within these continuously covered areas, the main difference with traditional regional classifications is in the representation of the results: in tables, the results are attributed to city names rather than to regions; on maps, they are linked to dots rather than to areas. These presentational artefacts must however not lead us to forget that the FUA analysis deals with regions and not with cities.

An important characteristic of these regions is that they are mutually exclusive. This implies that the FUA concept does not allow for shared influence areas. This weakness is particularly prejudicial for an analysis of potentials for polycentric development, as the presence of multiple overlapping urban spheres of influence are a key characteristic of Polycentric Urban Regions (PUR). The FUA approach *de facto* places neighbouring cities in a position of mutual competition in terms of spatial spheres of influence. It therefore cannot lead to the identification of possible benefits of more integrated, cooperative planning approaches.

The delimitation of mutually exclusive areas also entails that the complex geographical structures of major metropolitan regions are reduced to a single dimension. The FUA approach can for example not adequately account for urban regions structured around a first order city *and* subdivided into functional entities

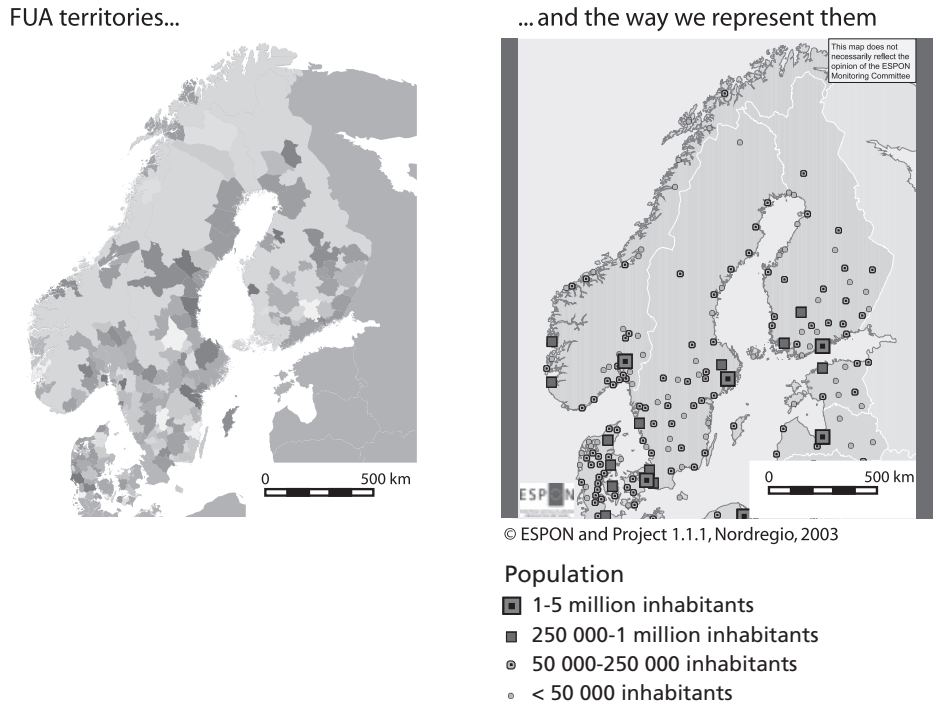


Figure 1: Comparing FUA territories with their representation – Nordic countries as an example

organised around secondary centres. In polycentric metropolitan regions, significant secondary centres will either be identified at the expense of the first order FUA, or be ignored and assimilated to suburbs and periurban rural areas. This may leads to misleading results at different scales: In the first case, the metropolitan region's national and European importance is underestimated. In the second case, the level of polycentricity at the meso and micro scales is underestimated.

ESPON 1.1.1 conceptualised and delimitated urban nodes in a pragmatic way. These methodological choices however had some significant intrinsic weaknesses, which limit the potential scope of the analysis. Firstly, the FUA delimitation criteria are not comparable from country to country. The definitions used are particularly open to criticism in some countries, such as Poland and Belgium. Secondly, the FUAs are mutually exclusive. This implies that polycentric urban regions and metropolitan regions with multiple relevant nodes are not described in an appropriate way.

Typologies of FUAs

Having reviewed the FUA approach to the identification and delimitation of urban nodes, we shall now analyse the way in which the typology of these areas was produced.

The FUAs were characterised according to seven sets of statistic criteria, as described in Table 1. Because of data availability problems, the measures were not compiled in a database. Instead, grades (generally from 0 to 4 or 5) were attributed to each city according to certain threshold values. In this way, some of the FUAs for which quantitative data were not available could be included in the analysis, with the help of experts assessing the category to which they were most likely to belong for each function.

Feature / Functions	Measured variable
Population (mass function)	Population
Transport function	Airport (passengers), ports (container traffic)
Tourism function	Number of beds in hotels (hand similar)
Industrial function	Gross 'value added' in industry
Knowledge functions	Location of university, number of students
Decision-making centre	Location of top 500 companies
Administrative functions	Administrative status of FUA

Table 1: Functions considered for the characterisation of FUAs

Five of these seven functions were used for the classification of FUAs. This classification was produced by calculating the average score for the five functions. The grades were in other words added up; arbitrary threshold were then applied to distinguish FUAs of local/regional importance, national/transnational importance and Metropolitan European Growth Areas (MEGAs). By applying this method, 76 MEGAs were identified, including all national capital cities except Nicosia, and a selection of major regional capital cities. It should be noted that no dynamic indicators such as population trends were included in this analysis. This has created a certain discrepancy with national perceptions of where dynamic regional metropolitan areas are to be found. The classification may indeed rank a major, but lethargic regional capital city higher than a smaller active one with high growth over the last decades.

The classification method reinforces this focus on mass and rank, rather than on profile. Some implicit hypotheses are indeed made when adding together different scores. First, the numerical value of the score is presupposed to reflect the distance between each category: When a city with over 100 000 hotels beds is given the score "5", and a city with 50 000-100 000 beds is given the score "4", and when these values are added up in combination with scores for other types of urban functions, then a city scoring "5" is implicitly considered 25% "better" than a city scoring "4". The information that is lost when constructing these categories and when applying such a strong hypothesis can be problematic.

The second, and most important hypothesis is that a city becomes a relevant major node in European polycentricity only insofar as it cumulates demographic mass with a high-level concentration of most of the five functions considered in the analysis. The analysis will for example not identify small cities with an exceptionally high number of students, as the "knowledge function" cannot compensate for low values in the four other functions when scores are added up.

This raises fundamental questions concerning our understanding of polycentricity. The ESPON 1.1.1 classification of FUAs was clearly inspired by the ESDP approach, as summarised in SPESP:

"At present only one large geographical zone is fully integrated in the global economy. This is the core area of the European Union, defined by the metropolises of London, Paris, Milan, Munich and Hamburg. There is, however, a potential for developing a number of dynamic zones of global economic integration within the EU territory. By so doing, the network of internationally accessible metropolitan regions and their linked hinterlands that this would produce could play a key role in improving spatial balance in Europe." (Nordregio, 2000)

The classification of FUAs was inspired by this quest for potential alternative "zones of global integration" outside the area delimited by London, Paris, Milan, Munich and Hamburg, which is known as the Pentagon. The underlying hypothesis is that the Pentagon has attracted a concentration of globally relevant functions because of its demographic and economic mass. In other words, the ESDP conceptualisation of global integration zones interprets the correlation between mass and global functions as a causal linkage. Following this logic, the relevant nodes for European polycentricity must be carried out through the identification or constitution of metropolitan entities with sufficient mass outside of the Pentagon. We term this search for alternative Global Integration Zones the "ESDP hypothesis" on European scale polycentricity.

The FUA classification methodology follows this ESDP rationale by identifying cities that accumulate functions, rather than to focus on centres of excellence within certain sectors only. Furthermore, the previously described system of grades, and the way in which these grades were added up, allowed some nodes to be classified as MEGAs despite their modest importance in the European urban system in terms of demographic weight and economic functions (e.g. Bergen, Cork, Le Havre, Luxembourg, Turku and Valetta). This results in a MEGA classification that does not reflects the European urban hierarchy adequately. Despite its focus on rank, the MEGA classification is biased in such a way that it does succeed in identifying the urban nodes which structure the European territory most. Any list of MEGAs would however be subject to controversy, as the academic (or political) perspective on growth potentials and on territorial polarisation trends determines how one grades cities. The main weakness of the MEGA classification was therefore not addressed by the polemics around the exclusion or inclusion of certain cities in the list of high-ranking European urban nodes. Its most important shortcoming is that it fails to identify the main vectors of polycentric development potential, namely secondary centres with a dynamic, endogenous development model.

As illustrated by Figure 2, the map representing the MEGA classification nonetheless gives the impression that there is a strong potential for polycentric development across Europe. This map indeed shows a number of nodes, spread across the European territory, and represented by equivalent symbols. The legend and the comments made in the report, admittedly underline that the 5 sub-classes of MEGAs are quite distinct. The map nonetheless conveys the impression that these cities could follow similar paths, for example leading "weak" MEGAs to become "potential" or "strong" ones. As shown by a simple population map (Figure 2), the MEGAs cannot be considered as a single category of urban nodes. The wide range of population masses implies that the current roles and possible future development paths of the MEGAs are extremely diverse.

By using symbols of the same size and colours of the same value, the ESPON 1.1.1 MEGA classification map (to the left) creates a visual impression that the 76 MEGAs have an equivalent weight. The map of MEGA population figures (to the right) shows that these 76 urban regions are in fact quite disparate in terms of demographic mass. The population of the largest MEGA is almost one hundred times larger than that of the smallest.

The ESPON 1.1.1 report furthermore showed that the logic of mass cannot lead to an improved territorial balance in Europe. The ESDP hypothesis would imply that neighbouring peripheral nodes join forces in order to constitute entities with

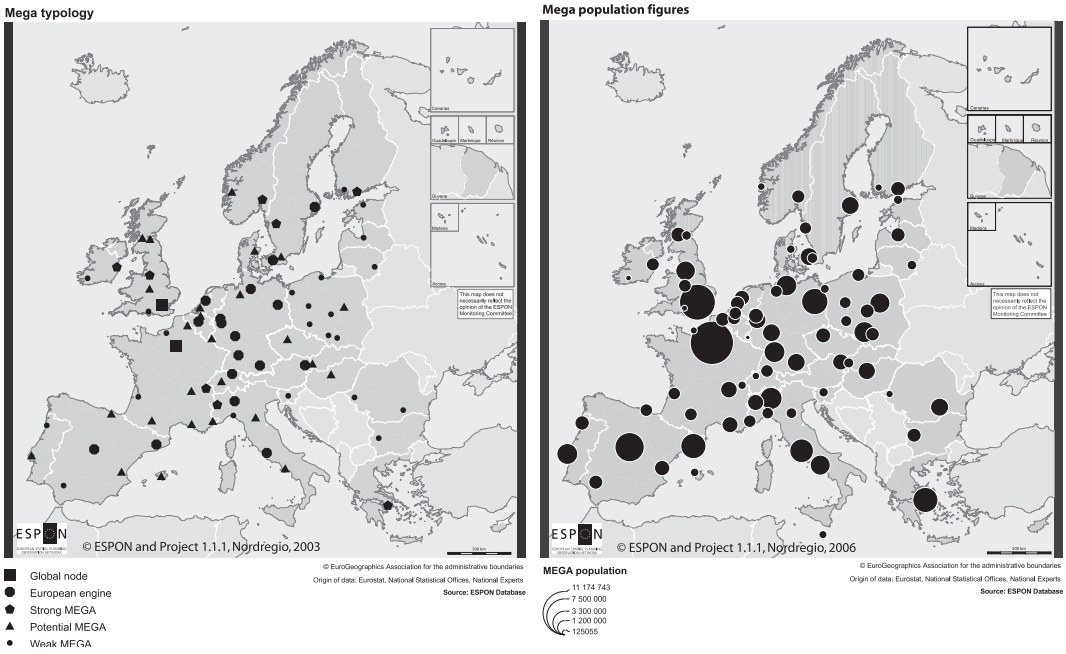


Figure 2: Comparing the ESPON 1.1.1 MEGA classification map with the map of MEGA population figures

greater mass, susceptible of counter-balancing the Pentagon. In order to test this hypothesis, ESPON project 1.1.1 modelled the effect of an increased integration between neighbouring cities on the European urban hierarchy. First, areas accessible in 45 minutes around all European FUA centres were delimited. If two such neighbouring areas overlapped by over one third, the smaller city was then integrated into the larger one. The resulting changes in the urban hierarchy (cf. Figure 3 available in the annex for colour maps) show that the promotion of metropolitan integration across Europe actually leads to stronger hierarchical contrasts between the core and the periphery.

More generally, a territorial strategy with the objective of changing the European urban hierarchy as such has little chances of succeeding, given the high degree of inertia of these systems. The growth model of the Pentagon cannot be reproduced in other parts of Europe, insofar as this model is based on unique concentration of people and economic actors. Polycentric development strategies can however promote a more multi-polar Europe by facilitating the emergence of alternative development strategies throughout its territories, and at all levels of the urban hierarchy. The next sections describe methodologies susceptible of identifying specialisations in the urban system susceptible of upholding such a polycentric territorial strategy.

Overall, we have shown that the FUA and MEGA classifications focus mainly on rank, despite an initial collection of indicators reflecting 7 different urban functions. The general problem with an approach focusing on rank is that it provides little new insight on the relative weight of cities, insofar as the analyses reproduce well-known correlations between functional importance and demographic mass. The FUA and MEGA classifications of ESPON 1.1.1 should therefore in theory have resulted in a classification of cities reproducing relations of demographic mass. The way in which the various indicators have been combined, using a simple addition

of grades, however implies that some of the FUAs are considered as MEGAs despite their modest importance in the European urban system in terms of demographic weight and economic functions. These original results of the classifications are to be considered as distortions rather than as novel analytical outputs. Indeed, the final classification of MEGAs provides no understanding of why a city such as Valletta is included in the list of MEGAs – it is simply classified as "weak", whereas the main justification of its low score is lack of demographic and economic mass, rather than weakness.

The FUA classification method furthermore neglects a central feature of polycentricity, which is functional specialisation in secondary cities. Instead, the methodology used implies that secondary cities with a high grade in one category will be assimilated to other ones with medium to low grades in all categories. In other words, the FUA classification has entirely focused on the perspective developed by the ESDP at the European scale ("the quest for new Global Integration Zones"), and has neglected development models promoted at the regional and local scales. The ESDP indeed specifies that specifies that "*co-operation between urban centres to develop functional complementarity"* is particularly important in *"less densely settled and economically weaker regions", as it "may be the only possibility for achieving viable markets and maintaining economic institutions and services which could not be achieved by the towns on their own."* (Commission of the European Communities (1999), p. 21). More generally, in a context of metropolisation, functional specialisation is the main strategy deployed by secondary centres to preserve their attractiveness against larger urban nodes. The next section describes alternative methods susceptible of revealing functional specialisation in secondary nodes.

Alternative approaches

In the previous section, we described how the ESPON 1.1.1 project developed an approach of polycentricity on the basis of the ESDP vision of the concept at the European scale, by focusing on mass and rank rather than on urban profiles. The methodology used reflected this perspective. The ESPON 1.1.1 report however concluded that polycentricity based on mass and rank will not contribute to improve the territorial balance in Europe. The initial methodological choices were consequently partly invalidated by the findings. The study consequently concluded that the focus of polycentric policies should be on functional specialisation in secondary cities.

In the present section, we describe some methodologies in line with this kind of perspective on the urban system. This first implies that the focus should be shifted away from ranking lists. Ranking lists reproduce the current hierarchical structure in the urban system, but fail to reveal nodes that could potentially challenge the core-periphery contrasts and promote an improved territorial balance. Other types of statistical analyses can reveal activity profiles that are more useful in terms of designing multiscalar polycentric policy options. The objective is to show that cities can be classified not only according to their size, but also according to the relative importance of different functions. A secondary city can host a major university, research facility or industrial plant. From a European polycentric policy point of view, it is important to gather knowledge about where such phenomena occur, in view of understanding how hierarchical patterns can be challenged.

How important is size?
Analysing FUA grades through a Principal Component Analysis

A Principal Component Analysis (PCA) is generally a useful first step when faced with a wide data set, in order to get a general view of trends and dividing lines. This statistical method identifies which co-variations between indicators account for the greatest proportion of the total variation of all indicators. If one imagines a representation of the data set as a cloud of points in a space with as many dimensions as there are variables, the PCA will first draw a line along the most elongated axis of the cloud. This line will be the first "component". Each city will have a coordinate along this line, which will be a synthesis of its coordinates along the axes of the most (positively or negatively) correlated initial indicators. The PCA then looks for the second most elongated line along any of the vertical planes to the first axis. The constraint of looking within the vertical planes only is applied in order identify interactions between variables that have not already been covered by the first axis (two vertical lines being, by definition, uncorrelated). The coordinates of each city along this second line will then synthesise the most significant correlations of the initial indicators than have not been expressed by the first line. This process can be reproduced iteratively, until the new lines identified cease to reflect structures in the data set.

In the present case, we will use the PCA to check the extent to which the "ESDP hypothesis" on polycentricity, i.e. that mass is the main factor of differentiation between cities, holds true. The analysis can unfortunately only be based on 4 out of the 5 indicators used in the original FUA classification, as quantitative data for Manufacturing is missing for over 25% of FUAs. All seven initial indicators can however be included in the representation of the results. We then get a picture of how the axes defined on the basis of the 4 "active" variables are positioned in relation

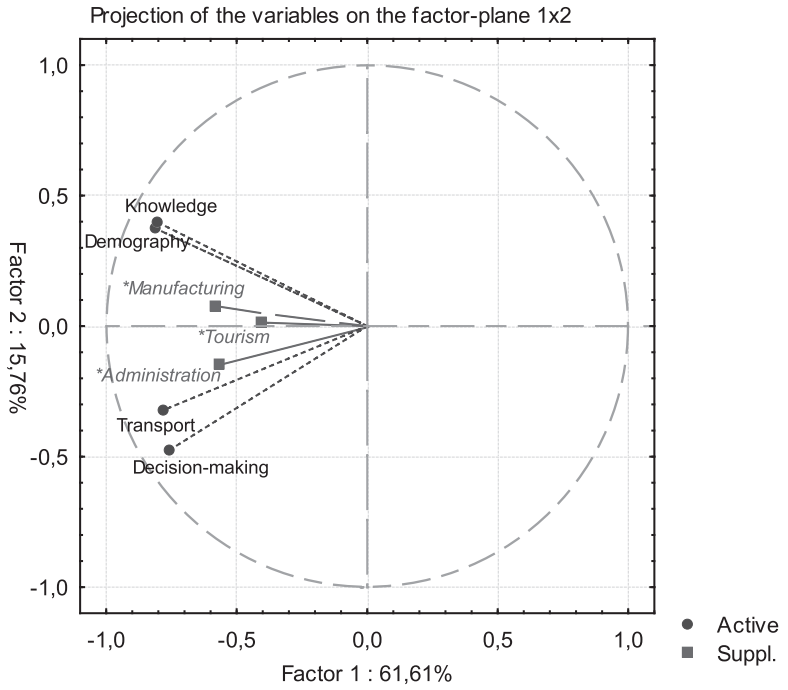


Figure 4: Two first axes of a Principal Component Analysis applied to the FUA grades

to the three "supplementary" ones. Figure 4 illustrates the two first axes obtained, which together account for over 75% of the total variation between FUAs.

The first component could be interpreted as a confirmation of the ESDP hypothesis, as over 60% of the variation is due to the differentiation between those cities that concentrate all functions, and those that are weak in all respects. In other words, the distribution of all seven functions is mainly determined by the urban hierarchy. We can first note that any other result would have been highly surprising: very few urban functions, if any, are primarily concentrated in small cities with few other functions. We are here touching upon the *raison d'être* of cities, as concentrations of functions that can benefit from economies of agglomeration.

This result can however also be reinterpreted negatively: almost 40% of the variation are not due to cumulative effects of mass, but to other types of differentiation between cities. This proportion increases to 44% if one takes administrative functions into account in the calculations. Public management in other words contributes to the functional specialisation in the lower tiers of the urban hierarchy. Generally, this signifies that an urban ranking system such as that which was used for the identification of MEGAs misses about 40% of the differentiation between cities.

The second component, which accounts from slightly less than 16% of the total variation in the data set, gives a first idea of how the different functions relate to each other, beyond the contrasts between cities concentrating a massive presence of all functions and those where all are less present. It shows that while decision-making functions are more specifically correlated with the presence of major airports or ports, higher education facilities (knowledge function) are still primarily implemented in FUAs where the highest population concentrations are to be found. These secondary distinctions allow us to avoid assigning variations in functional importance to demography only. Even if population figures remain the prime indicator of urban mass, there are other significant types of differentiation between nodes.

Using Ascendant classification to identify urban profiles

While the Principal Component Analysis is useful to understand the structure of the data, it is difficult to use it as a basis for typologies. Ascendant classification methods are in this respect more suitable. In the present case, we have used a classification method based on k-means. This implies that categories are built in such a way that as little of the variation between cities as possible occurs within the categories and, inversely, as much variation as possible is concentrated between categories. A categorisation in five classes, based on the five parameters demographic mass, transport, knowledge function, decision-making and administration, was chosen.

The results are interpreted by comparing the average score for each variable within the categories with the average overall score. The difference between the two average scores is illustrated in Figure 5.

These results confirm the importance of hierarchy as a factor of differentiation within the European urban system. Indeed, three of the five categories gather cities for which all functions are, on average, either over- or under-represented. Cluster 1 in Figure 5 comprises cities where all functions are generally heavily overrepresented. The 37 cities in this category are generally national capitals or metropolitan regions

of high economic importance, or so called nodal regions (Hamburg, Amsterdam, Antwerpen, Rotterdam, Frankfurt, Zurich, Frankfurt, Düsseldorf, Barcelona and Porto). The inclusion of Valletta in this cluster however shows that a high grade with regards to administrative functions is an important structuring element. The name of this cluster, "First tier nodal regions and capital cities", indicates this ambivalence. The category should ideally be subdivided in order to isolate the European nodal regions.

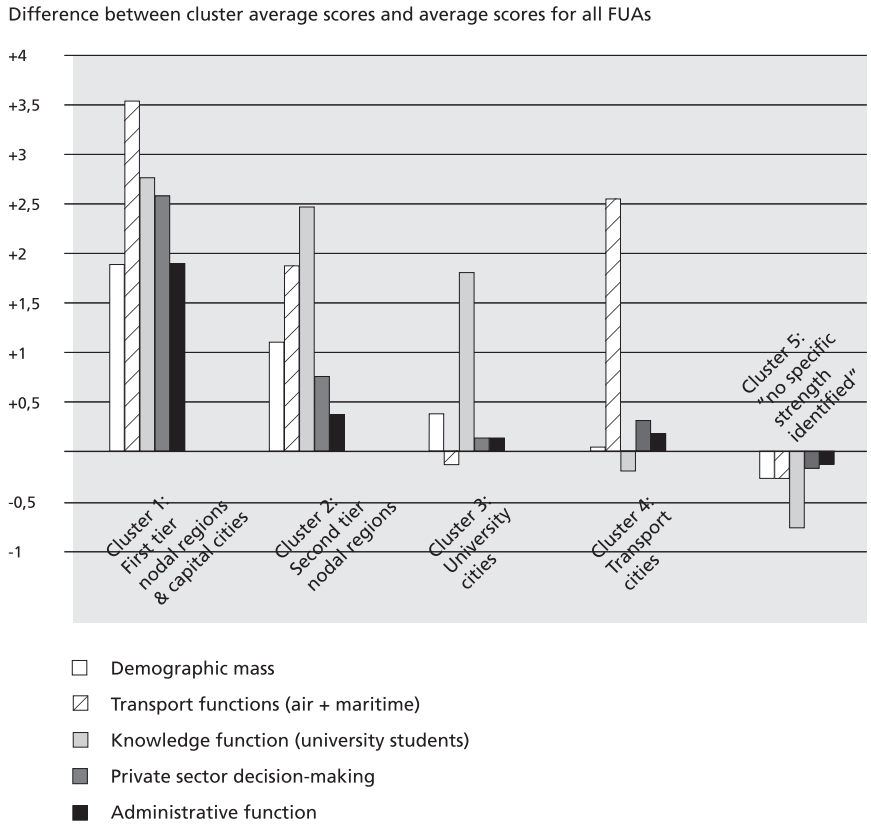


Figure 5: Characterisation of the five clusters of cities identified by applying a k-means ascendant classification method to the FUA grades

Cluster 2 comprises 74 cities where all categories are as previously over-represented, but to a more reduced extent. The over-representation of administrative, decision-making and transport functions is less significant than in Cluster 1, while Universities are on average as well represented. We call this category "second tier nodal regions".

The vast majority of the urban areas (1126 cities and towns) belong to Cluster 5, and have scores that are generally weak or average, and no specific strength covered by any of the 5 indicators used. These are the urban areas whose development could most contribute to increase polycentricity at the meso and micro scales. FUAs in this cluster are referred to as "Cities with no specific strength identified", in order to underline that a wide range of additional profiles, potentially involving a prosperous economic situation or a high development potential, would have been identified if a wider range of indicators had been used.

The two remaining clusters however show elements of functional differentiation. Cluster 3 confirms the presence of knowledge functions in lower tiers of the urban hierarchy. This cluster comprises the 327 cities that have higher education facilities, but only weak or average scores in other respects. It is important to note that cities in clusters 1 and 2 can also have major higher education facilities. We have not termed this group of cities the "university cluster" in exclusive sense. The name of the cluster instead refers to the fact that the presence of a University is the main distinguishing trait of these cities identified through the indicators used. In the same way, one would more easily refer to Cambridge or Heidelberg as "university cities", than London or Berlin, even if a higher number of students may be found in the two latter cities.

Cluster 4 represents the same kind of situation for transport functions. The 32 cities in this cluster generally have weak or average scores in all respect, except for transport. These are generally harbour cities (e.g. Helsingborg and Le Havre), or cities with major air traffic due to tourism (e.g. Ibiza and Larnaca) or due to the presence of air freight hubs (e.g. Luxembourg). In the same way as for the "university cluster", major transport functions can also be found in cities belonging to clusters 1 and 2.

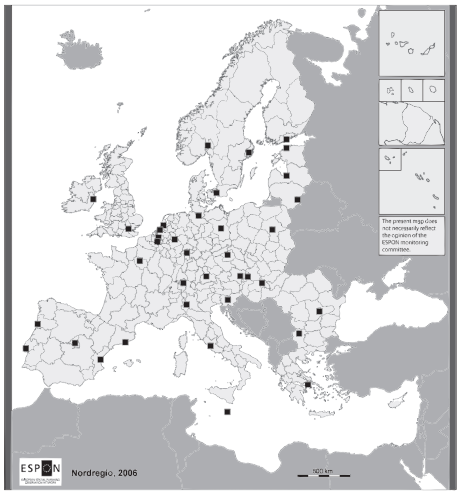
Figure 6 maps the FUAs belonging to each of the 5 clusters. The main added value of the method lies in clusters 3 and 4, which identify secondary urban nodes that have developed a significant strength within a given activity. A similar analysis with a wider range of indicators (e.g. proportion of employees high-technology, leisure or cultural activities) would be likely to reveal additional cities with a parallel type of profile. In other words, this methodology can reveal motors of economic development situated outside of the traditional centres of power and wealth. An better knowledge about these dynamic secondary nodes would provide useful insights for the design of a European polycentric development strategy.

Conclusion

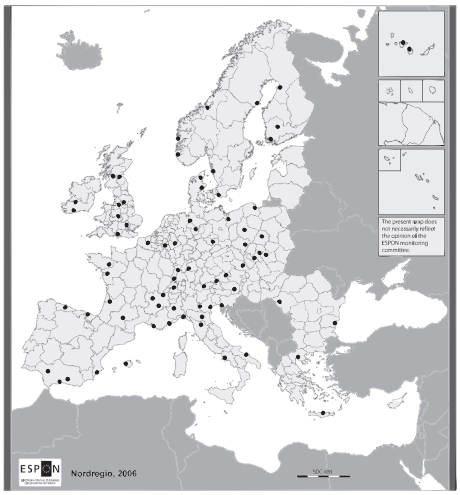
The FUA analysis broke new grounds through its geographical scope, and the number of urban areas that were taken into account. Compiling FUA delimitation for 29 countries, and corresponding statistical data was a major challenge, which was overall successfully overcome.

The study was designed as a test of certain hypotheses on polycentricity deriving from the ESDP. This test was in some regards inconclusive, especially as empirical evidence shows that creating *"several larger zones of global economic integration in the EU"* having characteristics similar to those of the Pentagon is not a realistic way forward. The study however neither had the time nor resources to draw all the consequences from these conclusions, by designing and implementing alternative analytical approaches.

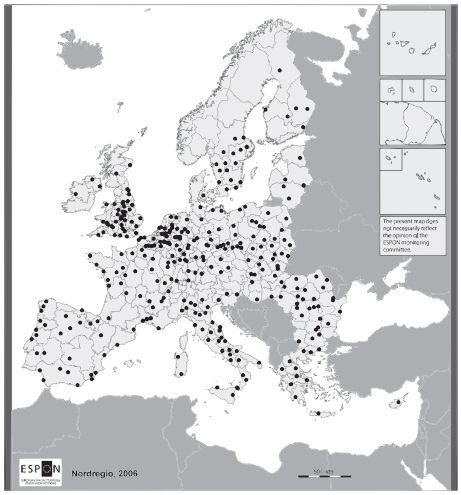
The present article has described some methods that could be applied for this purpose. There is however a need to rethink more in depth the conceptualisation of the city and urban region, in order to fully integrate the multiscalar aspects highlighted by the theory on polycentric development. As shown, one cannot do justice to the local, regional and continental roles played by a metropolitan region by using a single FUA delimitation. Different delimitations apply for each of these scales. An analysis of the European urban system with a polycentric perspective must take into account the complexity of multiscalar urban interaction.



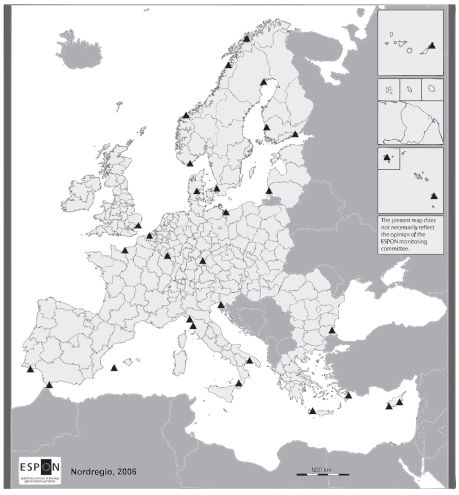
Cluster 1: "First tier nodal regions and capital cities"



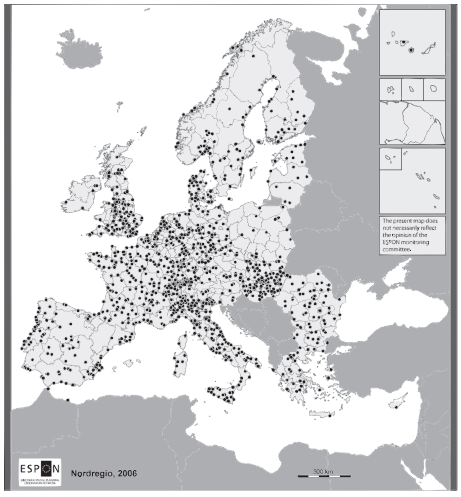
Cluster 2: "Second tier nodal regions"



Cluster 3: "University cities"



Cluster 4: "Transport cities"



Cluster 5: Cities with no specific strength identified

Figure 6: Typology of FUAs based on a k-means ascendant classification in 5 classes

The primary objective of a polycentric development strategy is not to change the urban hierarchy, but to avoid a reproduction of hierarchical relations leading to constant concentration, with metropolisation in some parts and depopulation in others. The main focus of research undertaken with a polycentric perspective should therefore be the assertion of secondary nodes within the urban system. We have argued that functional specialisation is a major aspect of this assertion. This however does not imply that one should underestimate the importance of institutional arrangements, either as vectors of local empowerment or as inhibitors of local growth dynamics.

In view of further research on the potentials for polycentric development in Europe, one could also consider whether analysing the functional areas of today is the best way to improve our insight on the policy to be developed for the cities of tomorrow. A city is a fluctuating object, which can expand both in terms of its number of inhabitants, its economic activities and its spatial extent. Observing what seems to be a city today, one may indeed fail to describe the city that will be relevant tomorrow. The city as a spatial development policy object is therefore not necessarily empirically grounded. To avoid these pitfalls, useful typologies from a territorial policy perspective would look at the potentials of possible cities, organised within imagined systems of interaction.

We have seen that the city has different boundaries according to the scale, depending on whether we consider the city in its region or in Europe. The boundaries also change over time, as mobility patterns change and as some cities gain influence while other lose out. Finally, each political project can seek to promote specific types of urban boundaries: do we want to promote wide polycentric urban regions with extensive commuting trips, but allowing for large, diverse and potentially dynamic labour markets? Or is it preferable to focus on smaller functional urban areas, with a higher degree of specialisation and economic vulnerability, but reduced transport needs?

The FUA delimitation issue is not a minor preliminary step for the quantitative analysis of European urban areas. Quite to the contrary, each FUA delimitation is determined by a given spatial and temporal horizon and specific policy choices. New perspectives on polycentric urban development in Europe require corresponding new delimitations of the realms of cities and urban regions. While the exploration of FUAs in ESPON 1.1.1 is a useful first step, it needs to be improved and put in perspective through a confrontation with other types of approaches of the urban system.

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TYPOLOGIES OF HAZARDS AND RISKS IN EUROPE SUPPORTING POLICY DEVELOPMENT

by Philipp Schmidt-Thomé

Philipp Schmidt-Thomé is a physical geographer working as a researcher and project manager for the Geological Survey of Finland since 1998. Being trained in soil science, hydrogeology and applied environmental sciences, he has been focusing on the topics of natural hazards, climate change and spatial planning in several EU funded research and regional development projects since 2002. Two of these projects on climate change and adaptation strategies have received the "Amber Tree Award" issued by the INTERREG IIIB Joint Technical Secretariat of the Baltic Sea Region.

Philipp Schmidt-Thomé explains how ESPON has broken new ground in the field of territorial analysis by presenting for the first time a European-wide regional integrated overview of hazards and risks. Despite data shortages and the complexity of carrying out the analysis at NUTS 3 level, he underlines that the 1.3.1 ESPON project developed an innovative methodology which makes it possible to identify and classify natural and technological hazards in Europe. Finally, Phillip Schmidt-Thomé challenges the European Union to take better into consideration the impacts of hazards and risks in spatial development in particular in the "European Regional Development Funds" (ERDF) and to enhance the over-regional and transnational cooperation in this field.

Introduction

Natural and technological hazards and risks can influence regional development and are thus relevant factors in territorial analysis. Until recently, only very little was known about the spatial patterns of hazards and risks from a comparative European perspective.

The ESPON project 1.3.1 "The spatial effects and management of natural and technological hazards in general and in relation to climate change" has cast some more light on these issues[1]. The project has for the first time conducted a European-wide territorial analysis and produced maps which provide insights on a number of selected hazards and related risks at regional level. This work has not only resulted in new knowledge on the spatial patterns of natural and technological hazards in Europe but also in a number of innovative methodologies and typologies used a European-wide analysis of hazards and risks at regional level.

This article briefly presents the published results of the ESPON 1.3.1 project (Schmidt-Thomé 2006, I), referring to the contributing authors and focusing on (a) the analysis of spatial patterns of hazards, (b) vulnerability and risk, (c) climate change and (d) potential application of the results in spatial planning and structural funding systems.

Analysis of spatial patterns of hazards

Since all of the European regions are populated and bear human assets, all natural and technological phenomena that can be hazardous to human life, properties, and the nature are considered as hazards.

[1] The ESPON project 1.3.1 on natural and technological hazards has been carried out between 2003 and 2005 by a transnational team consisting of experts from the Geological Survey Finland (GTK – lead partner), the Institute of Spatial Planning (IRPUD), Germany, the Centre for Urban and Regional Studies at the Helsinki University of Technology (CURS/HUT), Finland, the Institute of Ecological and Regional Development, (IOER), Germany, the Swedish Meteorological and Hydrological Institute (SMHI), Sweden, the Commission for Regional Development (CCDRC), Portugal and the National Institute for Engineering, Technology and Innovation (INETI), Portugal.

Hazards are here defined as natural extreme events or technological accident phenomena that can lead to threats and damages among the population, the environment and/or material assets. The origin of hazards can be purely natural (e. g. earthquakes) or technological (e.g. accidents in a chemical production plant), as well as a mixture of both (e.g. sinking of an oil tanker in a winter storm and subsequent coastal pollution).

Natural extreme events usually become a hazard when human beings or material assets are threatened. All so-called natural hazards occur on a more or less regular basis, as they are phenomena that belong to natural processes. Being part of natural processes they do not pose any threat to the natural system itself, as the nature is used to recover from natural hazards and adapt its life forms to it. In extreme cases, when humans influence natural hazards, e.g. by arson in the case of forest fires, these hazards are not purely natural any longer and can cause severe damages to the nature itself. Longer lasting natural processes, such as climate change and desertification, might pose spatially relevant threats but do not belong to hazards as such (Schmidt-Thomé & Kallio 2006).

Technological hazards pose threats to human assets and the nature, as they can cause damage and pollution that do not belong to natural processes. Many technological hazards focus on very small areas of emission (e. g. chemical production plants, oil pipelines, etc.). However, some hazards have a great perimeter of influence and thus can affect entire regions. Also, technological hazards can have very long lasting non-natural effects (e.g. oil spills and nuclear fallout). Furthermore, it is very difficult and in many cases not possible to define specific threatened areas, for example because of the time of the day, weather influence, and many other factors, during an accident (Schmidt-Thomé & Kallio 2006).

Definition and selection of hazards

The range of hazards that affect the development of regions within the European Union is wide, but in the ESPON context not all hazards are relevant. Hazards potentially influencing spatial development therefore were selected according to specified risk criteria. The analysis of spatial patterns of hazards required a selection of spatially relevant hazards. A methodological approach was employed that lead to the identification of 15 hazards, 11 natural and 4 technological, see also Table 1 below and Fleischhauer 2006.

The risk typology focuses on the risk perspective instead of the hazard perspective. This broadens the possibility of describing the interactions between hazards and the societal reaction and response to hazards (for example aspects of risk perception). Both aspects have to be considered in a risk management process. The German Advisory Council on Global Change (WBGU) criteria served as a basis for the classification and characterisation of hazards.

A so-called *spatial filter* screens hazards according to their spatial character. The occurrence of spatially relevant hazards is limited to a certain disaster area that is regularly or irregularly prone to hazards (e.g. river flooding, storm surges, volcanic eruptions). Spatially non-relevant hazards can occur more or less anywhere (e.g. car accidents, meteorite impacts). On the basis of these criteria, the 15 hazards listed in Table 1 have been identified as being of high relevance with regard to European territorial development.

Natural hazards	Indicators
Avalanches	Areas that have reported landslide/avalanche potential (derived from several sources)
Drought potential (based on recorded rainfall scarcity)	Amount of observed droughts 1904 –1995
Earthquakes	Peak ground acceleration
Extreme temperatures	Hot days Heat waves (7-day maximum temperature) Cold days Cold waves (7-day minimum temperature)
Floods	Large river flood event recurrence (1987 – 2002)
Forest fires	Observed forest fires per 1000 km² (1997 – 2003); Biogeographic regions
Landslides	Questionnaire, expert opinion of geological surveys of Europe
Storm surges	Approximate probability of storm surges.
Tsunamis	Areas that have experienced tsunamis, areas in close vicinity to tectonically active zones
Volcanic eruptions	Known volcanic eruptions within the last 10 000 years
Winter and tropical storms	Approximate probability of winter/tropical storms
Technological hazards	Indicators
Air traffic hazards	Civil commercial airports, Amount of passengers per year
Major accident hazards	Number of chemical production plants per km2 per NUTS3 region (chemical production plants represent an example for major accident hazards, as this was the only available data covering the ESPON space)
Nuclear power plants	Location of nuclear power plants, distance from nuclear power plants, based on fallout experience of the Chernobyl accident
Oil production, processing, storage and transportation	Sum of refineries, oil harbours and pipelines per NUTS3 region

Source: Fleischhauer 2006
Table 1: Selected natural and technological hazards

Once the relevant hazards had been identified, the approach of the project was to use results of existing hazard research and to combine those in such a way, that the obtained information is comparable over the entire project area (EU Member States plus its Accession Countries Bulgaria and Romania and the associated countries Norway and Switzerland; EU 27+2). In order to ensure comparability of results of all ESPON projects, all results are reported and displayed on the 3rd level of the Nomenclature of Territorial Units for Statistics (NUTS), i.e. on NUTS 3 level. The indicators measuring the hazards are listed in Table 1.

It is important to keep in mind that the results generated on NUTS3 level are rather generalizing and statistically rough, also because the sizes of the NUTS3 areas vary strongly over the ESPON space. This is especially the case considering the

independence of the data sources and the coarse resolution of the data available at the European wide scale. Since hazards, risks, catastrophes and disasters do not respect political boundaries, a categorisation into administrative areas will always lead to generalisations or exaggerations and thus giving partly deviated images of the reality.

Aggregating hazards

In order to provide not just a series of analysis that addresses one selected hazard each, but to provide a comprehensive and integrated picture of the spatial patterns of hazards in Europe, an aggregation of the single hazards was necessary (Schmidt-Thomé & Kallio 2006). Since the regions in Europe experience different types of hazards and risks a simple aggregation would lead to a distorting image of the actual hazard problem and perception of risk. In this case of multi hazard risk mapping, the question of weighting the relevance of certain hazards was evaluated in order to display hazards and risks from a European perspective. The Delphi method (cf. Helmer 1966) was adapted for the specific use of hazard weighting. To avoid distortion by regional bias, experts with a clear European perspective were chosen, and also the geographical provenance of experts was considered (Olfert et al. 2006).

Prior to the enquiry all experts were supplied information concerning the aim of investigation, characteristics of the applied method and the mode of use of results. The investigation comprised three rounds in the period from September to mid of December 2004. During each round experts had the possibility to alter the estimation after taking into consideration of the average value from the previous round. Ideally, the final estimation represents the so far final 'opinion' on the weight of each hazard. The result of the Delphi method revealed that the biggest emphasis is clearly on natural hazards (73,9 %) with floods (15,6 %), forest fires (11,4 %) and earthquakes (11,1 %) on the top of estimations. Technological hazards in total received 26,1 % with major accidents hazards weighted highest (8,4 %) (Olfert et al. 2006).

The aggregated hazard map (cf. Figure 1 available in the annex for colour maps) shows that the highest hazard classes form a kind of a scorpion-shape covering parts of southern, western, central and Eastern Europe. The two arms and the claws of this high hazard scorpion start off on the coastal areas of the United Kingdom and the Iberian Peninsula, respectively, and the head is found in central and southern Germany. The tail is then more scattered towards Eastern Europe, and finally turns southwards, petering out in Greece. Some hotspots are located outside of this "high hazard scorpion", i.e. central Italy and parts of southern Scandinavia. Most of the NUTS3 areas have a medium and some a low aggregated hazard. Besides isolated spots, only few large areas have a very low aggregated hazard, mainly in northern Europe and central-south France (Schmidt-Thomé & Kallio 2006).

In the map analysis one has to take into account that the 15 hazards (Table 1) used for these maps are based on current knowledge that is comparable among all EU 27+2 countries. Only 4 hazard types represent the technological hazards. The maps thus serve as an overview on the European regions, but detailed analysis for regional and local purposes should use best available data.

Vulnerability and risk

Having described the spatial pattern of hazards, the next step focuses on the risk they actually present and whether this risk shows any regional variations. Damage

potential and coping capacity were acknowledged as the two main sides of regional vulnerability; meanwhile risk is a function of the hazard and the vulnerability. Vulnerability is the degree of fragility of a (natural or socio-economic) community or a (natural or socio-economic) system towards hazards. It is a set of conditions and processes resulting from physical, social, economical and environmental factors, which increase the susceptibility of the impact and the consequences of natural hazards. Vulnerability is determined by the potential of a hazard, the resulting risk and the potential to react to and/or to withstand it, i.e. its adaptability, adaptive capacity and/or coping capacity. The overall regional vulnerability is thus measured as a combination of damage potential and coping capacity. The following formula is used: Vulnerability = Damage potential + Coping capacity (Kumpulainen 2006, UNDP, 2004; Cutter, 1996).

Risk is a combination of the probability (or frequency) of occurrence of a natural hazard and the extent of the consequences of the impacts. Risk is a function of the exposure of assets and the perception of potential impacts as perceived by a community or system. Risk = Hazard potential x Vulnerability (Kumpulainen 2006).

The vulnerability was measured as a combination of damage potential and coping capacity, expressed by a set of indicators. Hence only few data sets were available at EU 27+2 level, the vulnerability is measured with fewer indicators than in an ideal situation. The dimensions of vulnerability are embedded in either damage potential or separate indicators measuring coping capacity and each dimension. The basic criteria for choosing the indicators were the coverage of all vulnerability dimensions, as well as both damage potential and coping capacity. The indicators listed below are used to measure and compare regional vulnerability on European scale (Kumpulainen 2006).

The following four chosen vulnerability components are hazard independent:

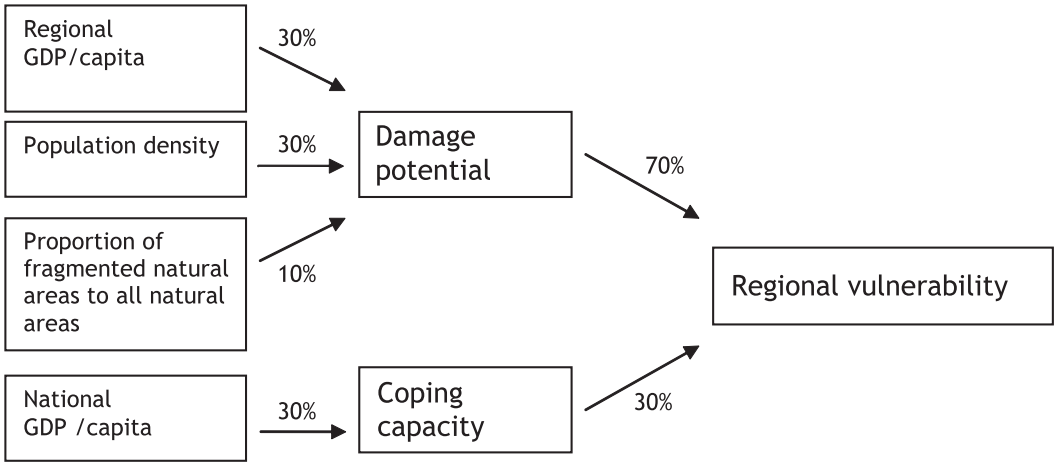
- The regional GDP/capita measures the value of endangered physical infrastructure and the extent of possible damage to the economy.
- Population density measures the amount of people in danger.
- The proportion of fragmented natural areas to all natural areas presumes that small and fragmented areas are more vulnerable, since they are likely to be completely affected if a hazard strikes.
- The national GDP/capita measures the capacity of people or regions to cope with a catastrophe.

The national GDP/capita was used to indicate coping capacity, since the presumption was that coping capacity is weak in poor countries and strong in rich countries. It was further presumed that there are no marked differences in coping capacity inside a country (Kumpulainen 2006).

Due to the fact that fragmented natural areas only refer to a specific part of the ecological dimension, the indicator was only given 10%. The other three indicators thus received the value of 30%, see Figure 2 (Kumpulainen 2006).

The risk map was obtained by combining the aggregated hazard map (cf. Figure 1 available in the annex for colour maps) with the regional vulnerability (Figure 2). The resulting complex legend of the aggregated risk map displays the risk in 10 classes, allowing a distinction of the source of the risk, i.e. whether it is based on hazard intensity or vulnerability (cf. Figure 3 available in the annex for colour maps).

The aggregated risk map is more complicated to analyse than the aggregated hazard map, mainly because of the higher diversification due to the integration of hazard potential and vulnerability. Nevertheless it shows a similar pattern as the aggregated hazard map, eventhough the scorpion shape of high risk has moved towards medium risk (classes 6, 7, and 8). The Pentagon Area displays the highest agglomeration of high risk, and the largest parts with low risk are found in northern Europe (Schmidt-Thomé & Kallio 2006).



Source: Kumpulainen, 2006
Figure 2: Integrated vulnerability index

Hazard cluster calculations reveal that certain multi hazard occurrences accumulate in distinctive European regions. The most prominent hazard clusters are floods, storm surges and winter storms in large parts of the North Sea Region and parts of the Baltic Sea Region, droughts and forest fires in the western Mediterranean and earthquakes and landslides in the eastern Mediterranean. Some of these cluster areas coincide with current delimitations of EU funding areas, for the example INTERREG IIIB (Tarvainen et al. 2006). Therefore EU finding platforms could be used to mitigate the influence of hazards on regional development.

Climate change
Natural hazards are one major pathway over which climate change, e.g. by leading to climatic extremes may become manifest. Therefore the spatial patterns of hazards were also analysed in the light of climate change.

The result of these models were combined with the hazard maps in order to outline regions that might experience an effect of climate change on some hazards. The reader must take into account that the discussed climate change results and maps are based on climate model data and thus show scenarios and not predictions or forecasts.

With the possible exception of the July 2003 heat wave in Europe, it has as yet not been possible to attribute either single climate extreme events or perceived trends in climate extremes to an ongoing climate change (Bärring & Persson 2006). Instead, concurrent changes in land use and societal sensitivity usually complicate, or even dominate the picture. According to climate change model results from EU research projects (Bärring & Persson 2006, Jones et al., 1999; Camuffo and Jones, 2002;

Brázdil et al., 2005), large parts of Europe will see a shift towards temperature extreme conditions that now occur mainly in the Mediterranean, North Africa and the southwestern Iberian Peninsula. In a similar way, the present day high extreme temperatures of France, Germany and Poland will move northwards towards the British Isles, southern Scandinavia, and southern Finland. Large parts of Europe are projected to have a warming of 5-8°C during warm extremes. Least changes are projected for northern Scandinavia and northern Finland, where the warming could be limited to 2-3°C (Bärring & Persson 2006).

Today's wintertime cold extreme climate becomes substantially milder, with the conditions of the SW Iberian Peninsula moving into France and Italy, French winter conditions appear in Germany and Poland, as well as in large parts of Central Europe and all the way up to southern Scandinavia. The Mediterranean coastal regions, in particular the Iberian Peninsula has today a long summer dry period that is projected to become even more extended. Large parts of southern Europe may see the summer drought extended by 1 2 months. (Bärring & Persson 2006).

One typology of regions that might be influenced by climate change is here presented for the case of drought potential, assuming that a longer dry spell leads to an increase in the drought potential (cf. Figure 4 available in the annex for colour maps). The information is based on observed precipitation and the change of the Dry spell index that were here reduced to four classes (Bärring & Persson 2006).

Spatial planning responses and policy recommendations

Eventhough spatial planning represents just one part of instruments involved in dealing with natural and technological hazards, it plays a vital role because it influences future land use. The task for planning is not so much to determine the actual risk, but to avoid potentially emerging risk situations. It is thus vital to determine by which kind of land use types the potential impact of single and multiple hazard events on spatial development can be lessened (Greiving & Fleischhauer 2006).

Spatial planning approaches are focussing on long-term mitigation activities rather than short term or imminent responses to hazards. It is important for spatial development to have an overview on all kind of potential hazards threatening an area, and especially the places where hazards overlap. For planning, it is therefore of high relevance to take a multi hazard approach, as well as hazard interplays, i.e. hazards triggering each other. An important issue are also natural hazards that can trigger technological hazards, so-called "Na-techs".

Spatial planning already has sufficient instruments to prevent adverse impacts on spatial development, but these can be improved (Greiving and Fleischhauer 2006). One main aspect is that planners could be sensibilised more on the topic of hazards, especially in the case when many actors and interests are involved in future land use proposals. One critical issue is, for example, the development of settlements in flood prone areas, both fluvial and coastal. Meanwhile there is an increasing pressure to build settlements along coastal areas, planning should ensure that the areas to be developed are well protected. This can often lead to conflicts of interest.

The European Union can support the mitigation of natural and technological hazards and the resulting societal risks. Main points to be addressed by the EU should

cover guiding principles, policies at various levels, as well as monitoring and research (Peltonen 2006).

The guiding principles for future planning activities should focus on preventive measures that include risk awareness (vulnerability), as adverse impacts of hazards can be prevented by appropriate planning, in other words land use, and other timely implemented measures (Munich Re 2006). The preventive measures could be included into the guidelines and project principles of special funding systems, for example the European Regional Development Funds (ERDF) (Peltonen 2006). Projects under the ERDF focus on structural development and cohesion policies, therefore hazards can be taken up into the principles of these funds to ensure that structural investments do not raise vulnerability and take potential risks into account.

Since regional development funds, such as the ERDF, also endorse over-regional and transnational cooperation, the potential impact of hazards and risks on spatial development should be taken stronger into account in such funds, for example in future INTERREG projects. One example on how to identify potential areas that could require active participation in risk and planning related projects is to map the extent of structural fund projects in hazard and risk related project activities. This kind of maps support the identification of areas affected by hazards that are lacking of projects with a special risk focus (Schmidt-Thomé et al 2006). In the INTERREG III programme period (2000-2006), only few of the INTERREG programme areas had directly mentioned hazards and risks in the programme descriptions. Therefore an evaluation of hazards and risks potentially affecting spatial development endorses taking risk management into account in future the structuring of funds (Schmidt-Thomé et al 2006).

In the long term it could therefore be considered that not only scientists, but also planners, local and regional actors, as well as other stakeholders should be involved and cooperate together in risk projects. This could ensure the dissemination of knowledge and a better understanding of potential threats on spatial development at an early stage. The long-term goal of such a "default" cooperation of stakeholders in such projects, and subsequent inter-disciplinary analyses of vulnerability and risk, is to tackle the continuous increase costs of natural and technical disasters (Munich Re 2006). Only a broad understanding of the risks of natural and technological hazards can lead to long-lasting mitigation strategies. Spatial planning can play an important role in supporting and shaping such strategies. An example is the joint assessment and evaluation of climate change impacts on coastal flood prone areas among scientists and planners in several case study areas in the Baltic Sea Region (Schmidt-Thomé 2006, II).

Conclusions on territiorial typologies on hazards and risks, further work

The ESPON 1.3.1 project on natural and technological hazards has for the first time established European-wide regional analysis of hazards and risks. This pioneer work, which is strongly based on the use of typologies is certainly only a first step (Schmidt-Thomé 2006, I).

The data availability was probably the major challenge to the project. Indeed, the hazards and risk presented here are partly based on preliminary data sets, due to insufficient comparable data coverage on the entire study area. The approach presents a first integrated overview on the spatial distribution of hazards on the

ESPON space, including vulnerability and resulting risk patterns. On the other hand it also shows that far more research is needed in the future. Better data sets with improved research methodologies should be used in order to obtain reliable results that can also be downscaled to local levels. The results shown here should not be used for local interpretations, as the data sets can be misleading if used for detailed analysis and often locally better data sets and research results are available.

Despite of the problems in data acquisition, the results of the project's methodology are valuable as they provide for a first approach on how to obtain and evaluate an overview on the range of hazards and risks affecting territorial development in Europe. While analysing the results the European scale has to be kept in mind. Other perspectives, e.g. regional or local one's will deliver different patterns, both on the hazard as well as on the risk component, as shown in the result of applications in case study areas (Olfert et al 2006).

In particular the typology for aggregated risks shows how challenging the situation becomes when trying to catch complex findings in a readable typology with 10 classes. The complex legend with its 10 classes tries to overcome one of the most principle problems in risk maps: The identification of the source of the risk. The chosen typology enables a differentiation of the risk source according to the influence of the vulnerability and the hazard intensity, respectively.

The work was not only challenged by the complexity of the task but also by the nature of hazards which does not necessarily comply to the statistical analysis units (NUTS 3 in this case) and which gave raise to some discussions when the epicentre of an hazards was rather on the edge of a NUTS region and thus not captured in its full dimension. On the other hand, the chosen approach has its very strong pro's as it enables a cross analysis with other data sets relevant for spatial development, as all other ESPON projects also reported on NUTS levels. It is again certainly true that only a local or regional investigation can deliver a more exact analysis of a certain hazard or risk, but for the goal of comparing challenges for spatial development on a continental perspective, the chosen administrative regions enable a very valuable categoristaion of hazard and risk types as a first overview.

These overviews can support the EU in assigning hazard and risk related structural funds and research funds to support regional development. The overview maps representing all of Europe can give a first indication on the type and magnitude of hazards (and possibly risks) affecting regions, for example in INTERREG scales. It should then be decided in cooperation with regional offices, which hazard and risk types are the most relevant, in order to define appropriate regional funding structures and programme priorities.

Future hazard and risk related projects on European scale should be able to spend a reasonable time on identifying and harmonising relevant hazard and risk data over the entire project area. It might also be of an added value, if there would be space to present results in several aggregations. In other words, it might be clearer if the hazards were first presented in views more appropriate to the actual hazard occurrence, for example in grid cells. The second step would then be the aggregation of the hazards in administrative levels, e.g. NUTS regions.

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TERRITORIAL IMPACT ASSESSMENTS

THE TERRITORIAL IMPACT OF THE COMMON AGRICULTURAL POLICY

by Mark Shucksmith, Deborah Roberts and Ken Thomson

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In this article Mark Shucksmith, Deb Roberts and Ken Thomson present findings from the ESPON project on the territorial impact of the Common Agriculture Policy, one of the EU's most important policies in financial, economic, environmental, social, political and cultural terms. They focus on the extent to which the CAP contributes to the goals of European spatial development. The authors show the existence of uneven effects across the EU 15 and suggests that neither Pillar 1 nor Pillar 2 or the latest CAP reforms are supportive of a more balanced and sustainable development of the Union. Finally, they present ideas on how the new Rural Development Regulation (2007-2013) can support territorial cohesion.

Introduction

The Second Report on Economic and Social Cohesion (European Commission, 2001) called for cohesion policy to promote a more balanced and more sustainable development of the European territory, in line with the European Spatial Development Perspective (ESDP; EC, 1999). As part of this, it identified the need for further work on the territorial impacts of EU sectoral and structural policies, of which one of the most important (in budgetary, economic, environmental, social, political and cultural terms) is the Common Agricultural Policy (CAP). This paper presents findings from a two-year project [1] aimed at providing new knowledge on the territorial impact of the CAP and rural development policy (Shucksmith, Thomson and Roberts 2005). It focuses on the extent to which the CAP contributes to the goals and concepts of European spatial development policies.

The following section of the paper briefly outlines the background to the project and the methods adopted, including also consideration on the sources of data for the analysis. Section 3 presents some key findings from EU-wide comparative analysis, focusing in turn on the territorial incidence of Pillar 1 (Market and income support) and Pillar 2 (rural development) support and the expected impact of the Mid-Term Review (MTR) proposals. The final section draws some conclusions and considers the implications for future policy development.

[1] Arkleton Centre for Rural Development Research, University of Aberdeen, Scotland, UK, ESPON Project 2.1.3 "The Territorial Impact of the CAP/RDP", available at www.espon.eu

Background, Methods and Data

During June 2003 the most recent reforms to the Common Agricultural Policy were agreed, following the MTR proposals of 2002 (European Commission 2002)) and the Long Term Perspective proposals published by the Commission in January 2003 (European Commission 2003). The main element is a single payment, decoupled from production, replacing the previous array of direct payments which have emerged since 1992 to offset the effect on farmers' revenues of the reduction in market price support. Notwithstanding this reduction, market price support still amounts to €56 billion pa (OECD 2002), on top of other subsidies, and it is instructive to begin by reminding ourselves of the scale of agricultural support which remains in the EU-15.

EU expenditure is at present: 45% on agriculture, 35% on structural funds, and the remainder on internal policies, external actions, administration and pre-accession aid. The latest reform envisages agricultural spending remaining at roughly current levels. Expenditure from EAGGF (totalling €40.5 billion in 2000) consists of the following main categories:

a) intervention expenditure (€30.5 billion), mainly direct payments (€25.6 billion).
b) export refunds (€5.6 billion), necessary to sell highly priced EU production at the lower prevailing 'world' prices elsewhere.
c) rural development payments (€4.2 billion from the Guarantee Section, and a further €2.5 billion from the Guidance Section, including Leader).

It should be noted that such expenditure excludes the largest component of the support received by EU farmers in the form of the higher prices paid by consumers within the EU. This "Market Price Support" is estimated by the Organisation for Economic Co-operation and Development (OECD) to amount to €56 billion. This element is of particular interest not only because it is the largest component, and because it is less visible, but also because this is the major concern of our trading partners in the World Trade Organisation (WTO).

Numerous writers have attempted to analyse and explain the forces underlying the evolution and reform of the CAP[2]. Swinnen (2003), for example, has observed that the need to finance EU enlargement has been a major driver of budgetary decisions and the MTR proposals. Other writers have also emphasised the pressure arising from WTO negotiations. Taking a longer term perspective, Buller (2003) has argued that the shifting dynamics of EU agro-rural policy reform reflect both an internal evolution and a motivation to maintain and perpetuate existing national shares of the CAP budget. Conceptualising policy changes in terms of four competing paradigms which vary in dominance over time (interventionist, neo-liberal, rural development, and multifunctional), Buller argues that it is these which have led to a fragmentation of the CAP into pillars, a move away from common policies towards regional and national policies, a growing diversity of instruments, and new approaches directed towards the production of public goods. These tendencies are illustrated further by Lowe, Buller and Ward (2002) in their comparison of the contrasting British and French approaches to the second pillar of the CAP. They argue that "the modalities and mechanisms of contemporary European agricultural policy are thus changing

[2] See Tracy (1997) for an authoritative and detailed account of the period up until Agenda 2000.

and three new aspects are apparent": subsidiarity, multifunctionality, and territoriality. As a result, they foresee the CAP evolving into a broad regulatory framework, within which member states can operate an increasing range of discretionary support measures, directed towards territorial priorities of agricultural landscape maintenance, employment, and sustainable rural economies.

The historical (and current) structure of the CAP and its instruments are largely non-territorial in nature. The major regional CAP designations – the Less Favoured Areas (LFAs) – are primarily oriented at agricultural potential and aim to compensate for production difficulties, but are not sufficient to achieve this fully. Compared to the major expenditures and effects of the direct payments their impact remains rather limited[3] (Crabtree et al, 2003). Similarly, many of the rural development measures are non-territorial in character, with the exception of those Guidance measures restricted to Objective 1 regions "whose development is lagging behind" and to regions previously classed as Objective 1 or 5b but now under the phasing-out, transitional programmes. The Rural Development Programmes (RDP), which were designed to replace some of the former spatially oriented measures, hardly took account of the regional dimension. Instead most implemented horizontal, national programmes.

However, within the EU15, there is considerable heterogeneity in the dependence on agriculture as a source of employment, the productivity of the sector, natural production circumstances, pattern of agricultural structures and in the application of CAP. These differences are even more pronounced when the 10 countries joining the EU in May 2004 are taken into consideration. As a consequence all CAP policy instruments, even those which are not territorially targeted, have differentiated impacts across space because of the wide range of contexts within which European farmers operate.

Against this background it is surprising that, below national level, the territorial impact of the CAP has largely been neglected by researchers and escaped from political discourse. The lack of knowledge and understanding of the role of the CAP in relation to rural development and cohesion is particularly noticeable in the context of recent CAP reforms and the recent EU enlargement which will almost inevitably result in a redistribution of Structural Funds towards the Accession countries (idem).

Given the requirements of the project, data availability and the objectives of the overall ESPON programme, a two-stage method was adopted for the project. In the first stage (year 1), a number of key hypotheses were developed regarding the territorial impact of the CAP and RDP. A key issue arising from this was the importance of differentiating between different types of policy instruments that comprise the CAP and RDP. This is because a) they have played a distinct role within the CAP reform process and b) because they include different objectives and are expected to have given rise to territorially distinct effects. In particular, it was found necessary to analyse separately "Pillar 1" and "Pillar 2" of the CAP, the former relating more closely to the production activities of farmers, while the latter is designated as the rural development pillar of the CAP. Within Pillar 1, it was felt important to consider separately the territorial incidence and impact of market

[3] Although there are exceptions, for example regions in Finland, France and Austria.

price support and direct income payments while, in addition to analysis of total Pillar 2 support, support via the LFA scheme and agri-environmental measures were also analysed separately.

Based on the hypotheses, statistical analysis has been carried out to assess the geographical distribution or "incidence" of CAP support and the extent to which changes in the CAP have been associated with observable changes in the economic, social and environmental conditions in areas at the NUTS 3 level or equivalent[4]. This has been augmented by findings from previous studies drawn from across the EU considering the spatial effects of the CAP and RDP (a reference to some of these studies would be nice). In order to study the potential territorial impact of the MTR proposals, results from an existing agricultural policy model, the "CAPRI" model[5] were apportioned from NUTS 2 to NUTS 3 level and then analysed, using mapping and linear regression techniques, with respect to the EU's social and economic cohesion objectives.

Building on the findings from this initial stage, stage 2 of the project used case-study methods to explore in more depth the causal relationships between CAP and rural development policy and particular outcomes of policy. Analysis focused, in particular, on how these relationships and outcomes are differentiated across space.

The starting point of the ESPON programme was the need to provide comparable regionalised data and analyses across sectors and activities influencing spatial development. A key part of the project was therefore the establishment of an EU database at NUTS 3 level for the EU 27 (including Switzerland and Norway) on which analysis of the territorial incidence and impact of the CAP could proceed. The main EU sources of data used were Eurostat (New Chronos) REGIO, DG Agriculture – FADN (Farm Accountancy Data Network), Eurostat (New Chronos) Eurofarm, DG Agriculture – CAP/RDR Expenditures, and Corine Land Use data.

Given the extent of agricultural data collection and the bureaucratic burden on farmers, the availability of detailed territorial data on agriculture across Europe is surprisingly poor. Very little data relating to agriculture are available at NUTS 3 level from Eurostat, DG Regio or even DG Agriculture, and, where data series do exist, up to 91% of data are missing. Moreover some of these data sources have incompatible geographies. For instance, both the FADN and the Eurofarm use hybrids of NUTS 1/2/3. In the case of the Eurofarm database these are known as "Districts". Thus it took considerable time ensuring that data was allocated in an appropriate way to constituent NUTS 3 regions before it could be used for both mapping and statistical analysis. Importantly, the process of database construction required drawing on national sources and the use of apportionment methods to allocate data from a higher geographical scale to NUTS 3.

Policy data were derived from a number of sources. OECD Producer Support Estimates (OECD, 2002) were used to estimate the value of market price support accruing to farmers (again using national census variables to distribute support to

[4] There are 1093 Nuts 3 regions in the EU-15, and a further 206 in the New Member States, Norway and Switzerland. The regions vary considerably in geographic size.

[5] Details of the CAPRI model can be found on <http://www.agp.unibonn.de/agpo/rsrch/capri/capri_e.htm> . The authors are very grateful to Dr. Wolfgang Britz and others at the Institute for Agricultural Policy, University of Bonn for providing us with output from the model.

NUTS 3 level) while the level of Pillar 2 support received by each NUTS 3 region was estimated in two ways. Firstly the combined value of environmental subsidies and LFA payments received by farmers (derived from the FADN database) was estimated, and secondly, funds for Rural Development measures, taken from Dwyer et al. 2002, were apportioned to NUTS 3 level , again using national statistics. Neither approach is entirely satisfactory – the first because it is based on sample data and incomplete in terms of coverage of Pillar 2 measures, the second because it is based on budget allocations and it is not clear how well these reflect actual expenditures. However, using both measures in this and subsequent analyses provides a better basis for understanding of the territorial impact of Pillar 2 policies.

Key findings

Pillar 1

Most support under the CAP is distributed through Pillar 1 (Market Price Support, Direct Payments, etc.). This is estimated to be €90 billion pa, when including the producer subsidy equivalents implied by artificially high prices (OECD, 2002). Previous economic studies have shown that the basic market price support instrument of Pillar 1 of the CAP is regressive and tends to accrue disproportionately to intensive large-scale farmers. Against this background, it was hypothesised that the incidence of Pillar 1 support is not consistent with the economic or social cohesion objectives of the EU.

Initial statistical findings relating to the distribution of Pillar 1 support in 1999 strongly supports the hypothesis. If the distribution of support was distributed in a manner consistent with cohesion, the level of support received by a region and its level of GDP per capita would be negatively correlated, support levels and unemployment rates positively correlated, and support levels and population change (an indicator of social cohesion) would be positively correlated. In contrast, the correlation coefficients shown in Table 1 suggest that total Pillar 1 support is distributed in such a way that it tends to benefit richer regions with lower unemployment rates and higher than average population growth.

	GDP per capita	Unemployment rate	Population change 1989-99
Total Pillar 1 support per ha	.088(**)	-.305(**)	.216(**)
Market price support per ha	.113(**)	-.371(**)	.199(**)
Direct Income payments per ha	-.156(**)	.209(**)	-.028

** Correlation is significant at the 0.01 level (2-tailed).

Table 1: The relationship between level of Pillar 1 support and cohesion indicators: Correlation coefficients for EU15 at NUTS 3, 1999

Table 1 also indicates that the spatial distribution of support through the two policy instruments that comprise Pillar 1 – market price support and direct income payments – are distinct. While market price support (like total Pillar 1 support) was distributed in 1999 in favour of richer regions, direct income payments were found to be generally higher in areas with a low GDP per capita and with high unemployment rates.

These latter findings support the argument that the introduction of direct payments has led to a more equitable distribution of support between regions of the EU (European Commission, 2001). However, Buckwell (1996) argues that direct income

payments remain problematic for two reasons. Firstly, the levels of payments have not been sufficiently linked to the income reductions associated with the lowering of commodity price supports. This has led in some circumstances to over compensation of some groups of farmers. Secondly, there has not been a clearly articulated rationale to support an indefinite continuation of such payments for a once-off policy change.

Further regression analysis showed that the geographical incidence of Pillar 1 support is largely explained by the distribution of farm types and sizes across Europe (see Table 2). In the case of Pillar 1 support, regions with larger farms tend to get higher levels of support, as do regions with a high percentage of land cover accounted for by irrigated land, complex cultivation and pasture. The percentage of land covered by vines or fruit exerts a negative influence (that is, regions with large areas of agricultural land dedicated to fruit of vine production tend to have lower levels of Pillar 1 support *ceteris paribus*. These findings reflect the differing levels of market price support and direct income payments for different agricultural products.

	Beta	T statistic
(Constant)	92.031**	9.679
GDP per capita	.000	-1.637
Unemployment rate	-2.630**	-7.898
Average farm size	345**	8.235
% Irrigated	1.270**	2.772
% rice	.075	.178
% vine	-.912**	-4.534
% fruit	-1.252**	-3.172
% olives	.390	1.537
% pasture	.194**	3.818
% associated crops	.994*	1.886
% complex cultivation	.932**	10.628
% natural vegetation	.257*	1.871
Macro accessibility (EU15)	.101**	4.094
Micro accessibility	-.513**	-5.654
N Adjusted R^2	921 0.361	

** indicates significant at the 5% level
* indicates significant at the 10% percent level

Table 2: The relationship between level of Pillar 1 support per ha UAA and farm variables for EU15 at NUTS 3, 1999

Another key finding from Table 2 is that the level of total Pillar 1 support is positively correlated with accessibility at an EU level: more accessible regions of Europe tend to get higher levels of support (cf. Figure 1 available in the annex for colour maps). The distribution of support thus runs counter to the ESDP's call for a shift from core-periphery patterns of development towards a more balanced

polycentric system which will "help to avoid further excessive economic and demographic concentration in the core area of the EU" (ESDP 1999, pp.67). However in terms of micro accessibility level (reflecting connectivity to transport terminals by car in both time and cost), there is a significant negative coefficient. In other words, having allowed for the influence of accessibility at the EU level, those NUTS 3 regions most distant from transport terminals tend to get higher levels of CAP support.

Pillar 2

Since the CAP was not originally designed as a cohesion instrument, it could be argued that the above findings relating to Pillar 1 are not surprising. In comparison, Pillar 2 of the CAP, often hailed as representing a fundamental departure in the nature of the CAP towards a more integrated rural development policy, might be expected to be distributed more in line with cohesion objectives. Pillar 2 is much smaller and covers 'rural development' measures including less favoured areas, agri-environmental schemes and farm modernisation.

Simple correlation analysis, summarised in Table 3, showed that at the EU level the incidence of Pillar 2 support is also not consistent with cohesion objectives, favouring the more economically viable and growing areas of the EU. The differences in the two sets of correlation coefficients is that one is based on FADN data and the other on RDF budget data. The differing results for the regional distribution of the Pillar 2 budget and the payments actually received by farmers may reflect underspending of the Pillar 2 budget in poorer regions, or the fact that FADN data on payments received includes only the Less Favoured Areas and agri-environment elements of Pillar 2.

	GDP per capita	Unemployment rate	Population change 1989-99
Total Pillar 2 support per ha (FADN data)	.143(**)	-.244(**)	.048
Total Pillar 2 support per ha (RDF data)	-.026	-.048	.032

** Correlation is significant at the 0.01 level (2-tailed).

Table 3: Pillar 2 support and cohesion indicators: Correlation coefficients for EU15, NUTS 3

Figure 2 (available in the annex for colour maps) shows the distribution of Pillar 2 of the CAP, the main elements of which are LFA support and agri-environmental subsidies, expressed on a per AWU basis. The distribution of agri-environmental support shows a clear northern state bias and results from regression analysis found a positive association between the level of agri-environmental support received by NUTS 3 region and its level of per capita GDP. No significant relationship between LFA support and per capita GDP or unemployment rates was found.

Drawing on the findings of previous studies (particularly Dwyer et al., 2002), various factors can be identified as contributing to these findings. Firstly, there are marked differences between those countries and regions for whom the Rural Development Regulation (RDR) is seen and used as a tool to promote environmental land management and those for whom it is a means for the modernisation of

agriculture (Dwyer et al, 2002). The richer regions of northern Europe tend to prioritise agri-environment and LFAs, whilst the poorer regions of the south and the accession countries prioritise agricultural development. For example, two-thirds of the Swedish budget for the RDP is allocated to environmentally friendly and organic farming, in contrast to Spain, which allocates 57% to the modernisation of agriculture and the agri-food industries, and just 10% to agri-environment. This difference is not only between countries but is also evident between the east and west regions of Germany, for example, and between the north and south of Italy (INEA 1999).

Another source of regional and national disparities is the uneven allocation of EU RDR funds (based on historical spend) together with the co-financing requirements for Pillar 2 spending. Under the Agenda 2000 agreement, the RDR has allocated only modest funds for the period 2000-06, and this will remain the case after the MTR 2003 agreement. Countries with arguably the greatest environmental and rural development needs remain very short of funds (Baldock et al. 2002, Dwyer *et al*. 2002). As Mantino (2003) relates, "one of the most relevant criticisms emerging from the debate on MTR was linked to the difficulty of various Member States in national and regional co-financing new rural development measures." In short, the RDR measures may be used least in the poorer areas of the EU because of the lack of match funding.

	Beta	T statistic
(Constant)	-25.88**	-9.283
GDP per capita	.000**	2.209
Unemployment rate	-.165**	-4.477
Average farm size	-.037**	-8.100
% Irrigated	-.086*	-1.660
% rice	.058	1.260
% vine	-.044**	-2.001
% fruit	.012	.280
% olives	.054*	1.958
% pasture	-.018**	-3.297
% associated crops	-.042	-.727
% complex cultivation	.006	.664
% natural vegetation	-.051*	-3.404
Macro accessibility (EU15)	-.017**	-6.166
Micro accessibility	.070**	7.208
Relative country GDP	.305**	12.078
N Adjusted R^2	933 0.371	

** indicates significant at the 5% level
* indicates significant at the 10% percent level

Table 4: Pillar 2 support per ha UAA and farm variables for EU15 at NUTS 3, 1999

When comparing uptake of Pillar 1 and Pillar 2 measures by farm size groups, we can, however, discern a quite contrasting distribution between the two parts of CAP (See Figures 1 & 2). The stronger relevance of Pillar 2 support for smaller farm sizes suggests that the different allocation criteria actually matter and that the orientation of Pillar 2 instruments towards more environmental sound farm management and diversification strategies is reflected in the higher participation of small farm size groups in support of these measures.

Table 4 uses the same variables as in Table 2 above to try and explain further the distribution of Pillar 2 support as reflected in the FADN database. This confirms the contrasting influence of farm size between the two pillars of the CAP: while larger farms tend to get higher levels of Pillar 1 support, there is a negative relationship between farm size and Pillar 2 support. In addition the regression results confirm the argument that differences in country-level GDP has influenced the uptake of Pillar 2 support.

Impact of MTR proposals
As mentioned above, analysis of the impacts of the MTR proposals was based on output from the CAPRI modelling system developed at the EuroCARE centre at the University of Bonn and elsewhere as a FAIR3 project in 1997-99. The modelling system involves physical consistency balances, economic accounting, considerable regional specification (e.g. set-aside rates, direct payment rates, etc.; for non-EU regions, OECD PSE/CSE data are used), and standard micro-economic assumptions. Given the objectives of our study, analysis was restricted to considering the estimated impact of MTR on farm incomes in 2009 relative to their level in the absence of CAP reform, and the effects are shown in Figure 3 (available in the annex for colour maps).

As shown in Figure 3 (available in the annex for colour maps), farm incomes in the EU 15 (including both CAP premiums and farm GVA) are expected to be only marginally affected by the MTR proposals, with changes of more than 5% apparent only in a small number of NUTS 3 regions in France (mainly in the south) and Austria (both show falling incomes) and in some or all of Northern Ireland, Belgium, northern Italy, Denmark and Sweden (all show rising incomes). Analysis found no statistically significant relationship between MTR impacts and cohesion indicators (GDP per head, unemployment rate and population change). Importantly, this suggests that the latest reforms of the CAP will do nothing to remove the existing inconsistencies between the CAP and cohesion policy unless they are accompanied by specific national priorities aimed at regional specific programme implementation.

Case Studies of Specific Measures

Farm Household Adaptation
A case study of Irish agricultural and rural development illustrates the kinds of adaptations made by farming households:

- The territorial impacts of agricultural and rural development policies are differentiated according to the resource and structural characteristics of regional economies
- There is a longer-term, underlying process of agricultural restructuring onto which policies are layered

- Policies may have inconsistent outcomes – as for example when farm price policies have territorial impacts that run counter to cohesion objectives
- In the more commercial farming regions, a comprehensive range of agricultural policies and/or agriculture-centred rural development policies will not provide a guarantee of rural demographic viability

Agri-Environmental Programme
The Agri-Environmental Programme in Pillar 2 pays farmers an annuity for managing their land in ways which support environmental objectives. This scheme has been found to contribute to the following core ESDP objectives:

- prudent management and protection of the nature and cultural heritage through encouraging a reduction in inputs of inorganic fertilisers; conservation of habitats, and preservation of the cultural landscape
- encouragement of appropriate land management
- high quality food production targeted at niche markets (e.g. through the provision of support for organic production)
- economic and social cohesion (and thus the retention of rural population) through the provision of income support in marginal areas

However, Territorial Impact Assessment has shown that Agri-Environmental Programme is less effective in:

- lowland areas of more intensive farming
- less prosperous regions of Europe

Statistical analysis at NUTS3 level also reflected the fact that richer EU member states tend to prioritise agri-environmental objectives more than poorer regions.

Less Favoured Areas Scheme
The LFA scheme in Pillar 2 compensates farmers who farm in less favoured areas for the difficult conditions (often mountainous). In the past this was paid according to the numbers of qualifying cattle or sheep, but now this is paid per hectare irrespective of the number of animals. Although this is the instrument which addresses the territorial dimension of agricultural production most directly, its national applications was found to suffer from:

- being largely correlated to the degree of farm net value added, i.e. higher compensatory amounts are applied in more prosperous regions, with much less use in "poorer" regions, largely because of national differences
- being standardised and independent of different production difficulties
- the political process of defining the border of LFAs (leading to further discussion on the criteria of delimitation and internal differentiation)

There is great variety in the LFA application across the EU. The Austrian case exemplifies how a detailed differentiation of production difficulties within the LFAs has been implemented and might offer a model for other regions of the EU.

Early Retirement Scheme
This scheme encourages farmers to retire through offering a retirement annuity. However, a highly differentiated territorial impact of the ERS is reported:

- the highest rates of ERS adoption were reported in areas of least need and where there are higher numbers of young farmers
- the structural effect was little different from that which would have occurred anyway, albeit over a slightly longer time scale
- such time gains are important in relation to depopulation problems and scarcity of farm successors prevailing in LFAs
- the more urban the region the higher is the farmers' uptake of the ERS

LEADER Programme
The EU Community Initiative, LEADER, was introduced in 1991 as a pilot to stimulate innovative approaches to rural development at the local level, particularly in lagging rural areas. Funding has only been committed "in almost homeopathic doses" (von Meyer 1997). Nevertheless, LEADER has had a huge symbolic impact, and moreover the evaluation studies of the LEADER programme have consistently shown its ability:

- To be *adaptable* to the different socio-economic and governance contexts and applicable to the small scaled area based activities of rural areas. It could therefore also reach lagging regions and vulnerable rural territories.
- To improve *intangible factors*, raise awareness and to strengthen strategy and co-operation within the region
- To provide a *broader range of beneficiaries*, especially from the non-profit sector, and female entrepreneurs

These characteristics are highly relevant to any attempt to develop the CAP towards meeting the EU's cohesion objectives. Of all the measures under the CAP, therefore, this seems to hold out the most potential for promoting territorial cohesion.

Conclusions
These results suggest that the CAP has uneven effects across the EU 15 and that, at present, it is not contributing towards the goal of more balanced and sustainable development across European territory. The findings relating to Pillar 1 of the CAP were perhaps to be anticipated. The policy instruments within Pillar 1 reflect strongly the agro-centric ethos that has dominated the CAP throughout its history. Until recently, where passing reference has been made to the role of agriculture in rural development, these have related to farmers' links upstream and downstream in the food chain rather than links within territories. The fact that support through Pillar 2 of the CAP is also distributed (at EU level) in a manner inconsistent with economic and social cohesion is more surprising and, in the light of EU enlargement, somewhat worrying. Pillar 2 measures provide the potential for accommodating regional strategies within the national level. However, to date this potential does not appear to have been fully utilised.

The ESDP argues that recent CAP reforms may have served to promote a more diversified approach to agriculture and a more integrated policy approach to rural areas in general. Certainly, in relation to the Rural Development Regulation, it is for member states to propose the breakdown of expenditure between these various headings. However, the findings presented here highlight that, although member states are more able to direct discretionary support measures towards territorial priorities, this is still only a very minor part of the CAP and, to date, only limited use has been made of the ability to be able to target support in this way (Mantino, 2002). In this respect, the rural development policies defined in Agenda 2000 are

fundamentally different from the policies and principles of the Structural Funds. While regional policy works so as to target support on particular territories, the RDPs reflect national discourses on rural development measures and lack a strong territorial dimension.

Three reasons were identified as contributing to the observed territorial incidence of Pillar 2 support: differing Member State priorities, inadequate and uneven funding of measures and the co-financing requirement: richer and poorer countries are using different measures with unequal means. Analysis based on the MTR proposals suggest that the recently agreed reforms of the CAP will not improve substantially the contribution it makes towards these higher-level EU goals.

Information on CAP expenditure and implementation at regional level is poorly developed, and support to overcome this information gap is limited. As the territorial dimension becomes integrated into rural policy, it will be very important to support policy-making in future through improving the database so as to enable Europe-wide territorial analysis.

On the basis of our statistical analysis and case study work, we would recommend larger spending on a LEADER-type approach if territorial cohesion is to be pursued. The more gradualist proposals of the Commission will allow the LEADER model to be applied on a wider scale by Member States who wish to do so, but although the EU Commission argues that "for the EU as a whole continuation and consolidation of the LEADER approach will be safeguarded" (EU Commission, 2004), the reduction in the overall funding of Pillar 2 is threatening genuine continuation of the LEADER programme in many countries.

We also propose, that the Pillar 2 budget should be *increased progressively*, as anticipated in the Agenda 2000 and MTR agreements and in the Commission's proposals for the RDR 2007-13. This might have been achieved either through continuing increases in the rate of compulsory modulation or preferably through the more substantial realignment of EAGGF towards Pillar 2. Unfortunately it seems that Pillar 2 is being squeezed as a result of budget pressures and a failure to agree of cuts to Pillar 1, and this will frustrate attempts to make the CAP more territorially cohesive.

To promote territorial cohesion, the new Rural Development Regulation 2007-2013 should contain *a broader range of permitted measures* under the four proposed axes, building on the lessons from LEADER and Objective 5b by including more measures which address sustainable rural development beyond the agriculture sector and which have a territorial dimension. Encouragement should be given to innovation and other issues of social capital, whilst more measures should be open to non-farmers. It is important these territorial measures include supporting *rural community development* – understood as an approach to working with and to building the capacity of individuals and groups within their communities

Finally, in relation to direct Single Farm Payments, while these remain, it is suggested that the Commission explore models through which territorial cohesion might be promoted by modulating these more progressively in richer regions of the EU, for example through *relating rates of modulation to farm business size.*

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TERRITORIAL COHESION AND NEW COHESION POLICY: CHALLENGES FOR OLD AND NEW MEMBER STATES[1]

by Laura Polverari and Irene McMaster

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The question whether European Cohesion policy contributes to territorial cohesion is not at least a question of aims set out in the guiding policy documents. Laura Polverari and Irene McMaster provide a thorough policy review giving insights on the overall European policy aims as well as on urban development experiences supported by the Structural Funds. Thus they illustrate that the change of the European Union, of its goals and those of its cohesion policy, represent an unprecedented, albeit not unchallenged, opportunity for the pursuit of territorial cohesion.

Introduction

Even though its long-standing objectives have been concerned with reducing economic and social disparities, European cohesion policy is already contributing to increased territorial cohesion within an enlarged EU. Nonetheless, it is only with the forthcoming programming period that the opportunity to explicitly pursue the territorial dimension of cohesion takes substance. Building on the inclusion of territorial cohesion in the draft EU Constitution, the proposals for future EU cohesion policy in the Third Cohesion Report, draft Regulations and draft Community Strategic Guidelines for the Structural and Cohesion Funds of 2007-13 seek to promote balanced development by addressing a broader range of territorial disparities within a more coherent spatial framework of development at European, national and sub-national levels.

There are however a number of challenges to the effective integration of territorial cohesion in European cohesion policy. The paper explores these challenges and considers the lessons that can be learnt from the recent experience in implementing the Structural Funds, in both EU15 and EU10 Member States. In doing so, particular attention is devoted to the two areas of Structural Funds strategies that can be considered pivotal for territorial cohesion: urban development and territorial cooperation. The paper draws on an extensive range of EPRC research over the past couple of years, namely the research conducted under the aegis of the ESPON programme (ESPON projects 2.2.1 and 2.2.2[2]), of the IQ-Net Consortium[3] and the research conducted for the 2nd International Conference "Benchmarking Regional

[1] This paper presents information drawn from a range of EPRC research and draws particularly from three papers previously elaborated by the authors: Polverari L, Quiogue N, Gross F and Novotný (2005) *Territorial Cohesion and Structural Funds Programmes: Urban Development & Territorial Cooperation*, IQ-Net Thematic paper no. 16(2) May 2005; Bachtler and Polverari (2005) *Delivering Territorial Cohesion: European Cohesion Policy and the European Model of Society*, Lincoln Institute Working Papers, and McMaster I and Novotný V (2005) *The Implementation and Management of EU Cohesion Funds*, Conference Discussion Paper No. 3, Benchmarking Regional Policy, 2nd International Conference, EPRC (April).

[2] http://www.espon.eu

[3] http://www.eprc.strath.ac.uk/iqnet/default.cfm

Policy", Latvia, April 2005. The authors would like to acknowledge the contributions made to these research projects by all colleagues at EPRC.

Territorial Cohesion: an emerging goal in a fluid policy environment

In considering how the European Union should best promote the goal of territorial cohesion, previous papers have suggested that there may be useful lessons in the recent experience of implementing the Structural Funds (Polverari and Bachtler, 2004 and 2005). The economic and physical impacts of the Structural Funds are widely debated and difficult to measure, particularly as definitions of cohesion – economic and social *in primis*, but also and even more so territorial - are ambiguous. However, it is widely accepted that European Cohesion policy has made a substantial contribution to increased cohesion across Europe in terms of policy approach, what is commonly referred to as the value added of European regional policy (Bachtler and Taylor, 2003). In "old" and "new" Member States alike, the Structural Funds and pre-accession aid (in the new Member States: Phare, ISPA and SAPARD) have made a contribution to addressing the goal of territorial cohesion thanks to the stimulation of a more strategic and integrated approach to policy planning and economic development, the support for a new model of territorial governance and the advocacy of a new method of policy implementation and delivery (Polverari and Bachtler, 2004 and 2005).

This is not to suggest, however, that territorial cohesion can automatically be delivered by the Structural Funds. First, territorial cohesion is not necessarily an explicit aim of EU Cohesion policy funds. Second, territorial cohesion is a relatively recent concept within the framework of European Cohesion policy (and not an uncontested one, see Faludi 2005). Third, the recent and forthcoming enlargements of the Union and the reform of European Cohesion policy raise new challenges for the achievement of territorial cohesion in an EU of increased territorial disparities. Whilst the territorial aspects of EU Cohesion policy programmes and the concept of territorial cohesion have been widely studied, the new context and challenges of territorial cohesion have received less attention. With this in mind, the following sections outline emerging challenges to the effective integration of territorial cohesion into EU Cohesion policy programmes.

A new European policy goal

The goal of cohesion, under the aegis of European Structural and Cohesion policy, has traditionally been confined to the socio-economic arena. It is only since the late 1990s that there has been a trend towards a wider interpretation of the role of regional policy which integrates the traditional policy goals within a broader spatial or territorial framework. This policy approach stems from acknowledgement that spatial differences in living and working conditions result from factors such as access to essential services, basic infrastructure and knowledge, and are dictated by geographical constraints such as peripherality, insularity or topography. Consequently, achieving 'balanced development' (whether at local, regional, national and EU scales) requires coherent and integrated action, as opposed to disjointed policy interventions.

In the past, Member States have resisted giving the EU the power to in the field of spatial development (beyond the economic and social remit of the Structural Funds). In recent years, however, several factors have increased the profile of territorial issues in the EU policy agenda: the inclusion of 'territorial' cohesion as objective of the Union in the Constitutional Treaty (Article 3); the contribution of

the ESPON research programme – the European Spatial Perspective Observatory Network which assess the scope of past and future EU policy actions to support territorial cohesion; and, finally, the European Commission's proposals for 2007-13 Structural Funds programmes which appear to strengthen the emphasis on territorial cohesion under European Cohesion policy (CEC, 2004).

Related, the role of the EU in addressing territorial cohesion issues was highlighted in the triennial reports by the Commission first in 2001 and then in 2004 (CEC 2004; CEC 2001). The Third Cohesion Report, in particular, links territorial cohesion to the issues of balance and harmonious development, as a counter to the concentration of human settlement and economic activities which characterise the Union. The goal of territorial cohesion has also been supported by the works of European Councils of Ministers. The Dutch and Luxembourg Presidencies, for instance, supported the territorial cohesion agenda. The Dutch Presidency called for "a political agenda [...] with the aim of creating a coherent approach to territorial development in EU policies" (Dutch Presidency 2004, 2) and also suggested a possible operational interpretation of the concept. The Luxembourg Presidency stressed the centrality of the integration of a territorial dimension in all European policies and, in particular, of the goal of territorial cohesion for both the Lisbon strategy and European Cohesion policy.

A new programming framework

As previously noted, proposals for 2007-13 Structural Funds programmes appear to reflect an increased emphasis on territorial cohesion on the part of the European Commission. From a strategic point of view, the Commission has proposed a new planning system which is of considerable significance for the territorial cohesion agenda. The proposals foresee a set of Community Strategic Guidelines, agreed by the Council, and National Strategic Reference Frameworks governing the delivery of individual operational programmes, with the intention of to ensuring that overarching EU policy objectives are reflected more clearly in the allocation of resources.

After a consultation with the Member States over 10 Issues of Community Interest and a preliminary draft submitted to the Member States in May 2005, the Commission published a draft Community Strategic Guidelines document in July 2005. This includes a chapter dedicated to "Taking account of the territorial dimension of Cohesion policy" and sets out three clear priorities for Cohesion policy: making Europe and its regions more attractive places to invest and work; improving knowledge and innovation for growth; and, creating more and better jobs. The text outlines sub-priorities and actions under each of the three priorities, stating that the latter should be interpreted differently in the programmes under the Convergence and Competitiveness/Employment Objectives - to give prominence, respectively, to growth enhancing conditions, and research, innovation, accessibility and job creation.

The Guidelines also make specific reference to the two key issues of urban areas and territorial cooperation. In relation to urban areas, the Guidelines suggest the need to support the competitiveness of neighbouring cities and the "balance between the economically strongest regions and the rest of the urban structure" (CEC 2005, 29), to be achieved through actions in the fields of rehabilitation of the physical environment, entrepreneurship and local employment, social inclusion and urban regeneration (CEC 2005, 30). As regards territorial cooperation, the

Guidelines place emphasis on the need for complementarity of cross-border, transnational and interregional cooperation with the three priorities enunciated.

New Resources

The Guidelines set out priorities linked to territorial cohesion. However, the extent to which the issue of territorial cohesion will be tackled in practice and can be delivered will depend on a number of issues, including the new financial resources. Since the Commission set out its Financial Perspectives for the 2007-2013 period in July 2004, subsequent debate among the Member States highlighted that it would be difficult to retain the proposed ceiling of resources for EU Cohesion policy (Bachtler et al 2005; Bachtler and Wishlade 2005) and in fact the agreement that was reached in December 2005, of a global allocation for Cohesion policy of just over €307.6 billion, marked significant cuts to the Commission's original proposal of €336.12 billion – cuts of over €28.5 billion (Council of the European Union, 2005).

Not only have the overall financial resources made available to Cohesion policy declined overtime, but the percentage allocation to the three Objectives – Convergence, Competitiveness and employment, and Territorial cooperation - has also changed throughout the negotiations. The proposed indicative 78, 18 and 4 percent foreseen by the Commission for the three Objectives in the Third Cohesion Report (CEC 2004, xxxviii-xxxix) has gradually been adjusted to give more weight, in compensation of the proposed overall reduction of Cohesion policy funding, to the regions in the Convergence Objective. The percentage allocations to the three Objectives would change from the original 78, 18 and 4 percent to: 82, 15 and 3 percent in the "negotiating box" of 19 May; 82.3, 15.26 and 2.45 percent in the "negotiating box" of 15 June (Bachtler and Wishlade 2005, 31); and, finally, 81.7, 15.8 and 2.4[4] percent in the agreement of December 2005 (Council of the European Union, 2005).

The development of debates on the financial perspective raises two key considerations, linked to the capacity of future programmes to tackle territorial cohesion. First, the non-Convergence Objective programmes will be faced with a significant reduction of resources. This will contribute to a streamlining towards the dominant domestic policy priorities, which may imply a lack of spatial focus. Faced with substantial financial cuts, future programmes may opt for a horizontal thematic concentration (for example, on themes such as the development of SMEs, social capital or innovation), rather than spatial targeting (e.g. on urban development and territorial cooperation). This and the more general need to align the strategies to the objectives of the Lisbon agenda, as advocated by the Community Strategic Guidelines and by the proposed Structural Funds regulations (with the "earmarking" of resources proposed

[4] It should be noted that in April 2006 €4,000 million were added to the overall EU Budget 2007-13 following negotiations between Austrian Presidency of the European Council, Commission and European Parliament. Of this sum, €300 million should be allocated to Cohesion policy (sub-heading 1 b), specifically for territorial cooperation. This makes the respective proportion of resources to the three Objectives equal to respectively 81.62, 15.84 and 2.53 European Parliament Press Release, 05.04.2006 www.europarl.europa.eu .

by art. 8 of the general regulation)[5], may prove detrimental to the inclusion of territorial cohesion-related priorities in the programmes.

Second, the stress placed on territorial cooperation, first in the Third Cohesion Report and then in the Community Strategic Guidelines, has been strong in principle but has not been matched by parallel financial commitments. A number of Member States emphasised the importance of territorial cooperation in the debate over the Community Strategic Guidelines. However, in the budget negotiations, the new strength of the Objective 3, 'Territorial Cooperation', has been gradually reduced, due to cuts in funding for this Objective.

A new European Union

A key driver for the reform of EU Cohesion policy was the enlargement of the Union from 15 to 25 (and potentially 27+) countries. EU enlargement also had direct, practical implications for territorial cohesion. First, EU enlargement has had a dramatic impact on territorial disparities within the EU. From a cross-national perspective, development disparities compared to the EU average are substantial in the new EU Member States. Based on measurements of GDP per head in purchasing power parities (PPS) in 2002, Latvia and Lithuania, which are both classed as NUTS II regions, are amongst the poorest regions, with GDP per capita levels 37.3 percent and 40.6 percent of the EU average respectively[6]. Within the new Member States, regional disparities are either significant and/or on the rise. Key concerns are: the growing divide between capital cities (and, in some countries, large urban centres more generally) and the rest of the country; the problem of rural areas dependent on often-outdated agricultural structures and suffering from out-migration and related demographic problems; and the decline of traditional industries, with high levels of unemployment resulting from structural changes brought on by globalisation and transition to a market economy. In geographical terms, these features are often reflected in an east-west divide, with western areas generally benefiting from easier access to markets while, in the east, there are often very poor rural areas, with inadequate infrastructure, uncompetitive structures, sparse and poorly qualified labour and fragmented agriculture. This pattern is clearly illustrated by the case of Slovakia, where in 2000-2002 the capital city region in the west of the county, Bratislavský kraj, had a GDP per head in purchasing power parities over three times that of the country's eastern region, Východné Slovensko.[7]

Second, as recipients of substantial amounts of EU Cohesion policy funding, how the new Member States use Structural Funds resources has implications for the extent to which the Funds will contribute to the goal of territorial cohesion. Understanding the Member States' experiences of past and current programmes and the scope of future programmes is crucial to gauging the potential constraints

[5] Art. 8.2 bis of the general regulation draft (version 9 March 2006) states the following: "The assistance co-financed by the Funds shall be targeted on the EU priorities of promoting competitiveness and creating jobs, including meeting the objectives of the Integrated Guidelines for Growth and Jobs 2005-2008. To this end, in accordance with their respective responsibilities, the Commission and the Member States shall ensure that 60 % of expenditure for the "Convergence" objective and 75 % of expenditure for the "Regional competitiveness and employment" objective of all the Member States of the Community as constituted before 1 May 2004 are set for the above-mentioned priorities. These targets, based on the categories of expenditure in Annex IV shall apply as an average over the entire programming period".

[6] EUROSTAT 'Regional GDP Per Capita in the EU 25' January 2005.

[7] Ibidem.

that may hinder the practical achievement of territorial Cohesion and this is even more crucial with respect to the new Member States. The new Member States already received substantial amounts of EU support and in the future will receive the largest proportion of EU Cohesion policy funding. In the lead-up to enlargement, the budget for pre-accession assistance for the new Member States was €3 billion per year (1997 figures) during the 2000-06 period (CEC, DG Enlargement, 2002). As Cohesion countries, with mainly Objective 1 funding, the EU10 countries have programmes in place which involve an investment of more than €24 billion in Community Aid from Structural Funds and Cohesion Funds for the period 2004-06. In advance of the next programming period, new National Strategic Reference Frameworks and Operational Programmes are being developed.

As is the case with Structural Funds Programmes in the EU15 countries, in many respects the pre-accession funds and Cohesion policy programmes have already contributed to the territorial objectives. Even though territorial and spatial development themes are not necessarily explicitly addressed, promoting convergence with the EU-15 and promoting balanced development are very much at the heart of the Cohesion policy strategies that are set out in the current programming documents of the new Member States. The impact of pre-accession funds is not easily measurable. However, these programmes did address a range of issues linked to the overall aim of territorial cohesion. Although, the primary aim of the pre-accession funds was to support the implementation of the acquis, the funds could contribute to territorial cohesion in a number of ways. For instance, the Phare programme has offered support to regions capable of acting as growth poles for national and EU economies. Additionally, spatial integration between the recipient countries and the EU15 have been strengthened by cross border programmes funded by pre-accession resources.

However, past and current experience of EU Cohesion policy programmes reveals that policy-makers face complex challenges in fulfilling the objectives of development programmes and effectively implementing planned actions which have associated impacts on their ability to tackle the issue of territorial cohesion (Davies, S. and Gross, T. 2005). These tasks are all the more complex in the new Member States, and particularly the Central and East European New Member States for the following reasons.

First, the dual challenge of economic catch-up and increasing regional disparities raises fundamental policy challenges and questions for policy makers, particularly in the Central and East European Member States. It also raises crucial issues about how best to tackle the issue of territorial cohesion in the context of these countries. For instance, should distinct policy measures focus on promoting regional equity or should broad strategies focus upon efficiency, national competitiveness and economic growth? Should limited regional policy resources target lagging regions, with the aim of promoting balanced development within the country, or are resources best targeted at growth poles, with the aim of supporting national economic catch-up with the EU average? Given the range of development challenges facing the EU10 countries, what issues should regional development policies tackle and in what order? In practice responses have varied, in the Baltic countries the regional problem is generally perceived more in terms of national rather than regional development. Consequently, regional development is seen as secondary to the basic policy task of promoting economic growth and productivity. There are some countries, including Lithuania and the Slovak Republic, where

national regional policy is explicitly based around growth poles, albeit, in the Slovak case, alongside the goal of balanced regional development.

Second, future programmes also have to reflect economic and social development in each Member State and, at the same time, reflect the Community Strategic Guidelines. For instance, the proposed Guidelines have a strong emphasis on RTDI and the 'knowledge economy'. There is some concern in the new Member States that too narrow a focus on 'the knowledge economy' could imply insufficient funding for other crucial interventions, notably public investment in transport and environmental infrastructure, public transport systems, education and health infrastructure (Davies, S. and Gross, T. 2005, 16).

Third, the issues that are faced are made all the more challenging by the limited experience in many of the new Member States of strategy development. Particularly in the Central and East European new Member States, traditions of sectoral, centralised policy making are well-established, making the development of strategic, consultative policy-making difficult. Pre-accession aid programmes were criticised for not offering policy-makers enough opportunities to become involved in programme development. More recently, current and future programmes have been criticised for their lack of strategic focus. For instance, a number of evaluation reports point out that the aims, priorities and measures are too general, leading to problems with insufficient selectivity, lack of detail and strategic focus, and potential overlap. Another weakness identified is a lack of consistency across the programmes, i.e. programme aims do not reflect development needs highlighted in the programme analysis. Weaknesses in strategies will influence the effectiveness and efficiency of EU Funding programmes and the impact they will have on building territorial Cohesion.

Finally, despite the huge effort gone into developing appropriate implementation structures and reducing bottlenecks to programme implementation, a number of programmes have suffered from weak application rates and poor quality applications. Protracted approval processes have delayed the introduction of a number of grant schemes, with knock-on effects on commitment of funds and project generation. Of particular relevance to territorial cohesion is the fact that the number and quality of applications differs considerably between regions. Interestingly, some 'lagging' regions, which have long standing experience of EU support through pre-accession aid, appear to be well placed for developing more innovative and robust project submissions, e.g. Moravia-Silesia Region in the Czech Republic, Silesia in Poland and Tartu in Estonia. In contrast, in Estonia stronger municipalities were found to be more likely to have the financial and human resources to develop stronger project proposals (McMaster and Novotný 2005, 18).

Experiences with urban and territorial cooperation

As well as taking into account the new context for Cohesion policy and territorial cohesion, it is important to take stock of past experience and policy practice. Related, to understand how future European Cohesion policy might support territorial cohesion, it is worth considering how key measures have been implemented under the current Structural Funds programmes. The remainder of this paper focuses on the key themes of urban development, and the related polycentric development agenda, and territorial cooperation which are two important pillars of European Cohesion policy, with strong links to the objective of territorial cohesion.

Urban development in EU15 and EU10 Cohesion policy programmes

The extent of the inclusion of urban development interventions in the Objective 1 and 2 programmes varies considerably across and within countries. Programmes vary linked to the nature of the areas covered and, in particular, whether or not they include urban areas. The approach to territorial cohesion suggested by the Third Cohesion Report and in the more recent inter-ministerial policy documents (Rotterdam and Luxembourg) seems to imply a new conception of the role of cities, which places particular emphasis on the full exploitation of their true economic potential. However, in the current generation of programmes, even in those cases where urban areas feature significantly in the eligible areas (e.g. the Western Scotland, Paìs Vasco and Nordrhein-Westfalen Objective 2 programmes) the strategic approaches adopted for the support of urban areas do not embrace the concept of 'polycentric development' outlined above.

Instead, the programmes investigated could be classified as displaying either:

- a "reactive" approach to urban areas/development,
- a "proactive" approach to urban areas/development,
- an emphasis on the creation urban-rural relations, or
- no urban-related measures at all.[8]

In the first group of programmes, special emphasis is placed on the problems and weaknesses of urban areas. This approach has been named 'reactive' and is found in those programmes which include large urban conurbations (i.e. the Spanish programme of the Paìs Vasco, the two UK programmes of North-East England and Western Scotland, and to a more limited extent, in the two German programmes for NRW and Sachsen Anhalt). These programmes tend to include large infrastructure projects of urban renewal and regeneration, characterised by: high volume of resources; participation of local partners, also from the private sector, in the financial package; and the predominance of physical investments (such as buildings, transport infrastructure, urban development etc.). These measures are often complemented by other types of intervention, such as training initiatives, employment policies, and entrepreneurial support. In such cases, the programme intervenes directly to support urban areas with particular socio-economic problems. Western Scotland represents a striking example of a comprehensive and integrated treatment of the urban theme. It aims to achieve a balance between social inclusion and urban development as an economic driver. The underlying strategic spatial development principle is the linkage of areas of opportunity and need, in line with the domestic policy of the Scottish Executive. The latter has developed several categorisations of areas of need, including Social Inclusion Partnerships (mainly brownfield sites), Social Enterprise Zones (aimed at mobilizing local actors and adapting budgets to tackle multiple deprivation) and Urban Regeneration Areas (involving a package of activity that complements or encompasses employment creation, business opportunities, training and related activities, and linkages to exclusion areas). The programming document takes these categories into account when selecting projects.

[8] This characterisation is based on an analysis of programmes that take part in the IQ-Net network. A more detailed description of these groups of programmes and their approaches to urban development can be found in Polverari et al 2005, 17-52.

A second approach, which is evident particularly in the Western Finland Objective 2 programme, is more indirect. Urban areas are not targeted in the programme per se, but are by default supported as part of a wider economic development strategy which places emphasis on growth poles and on their specialisation. The investments are of an economic nature (business infrastructure, aids to firms and start-ups, training and R&D) and flow naturally towards the main urban centres. In this case, the emphasis is on the strengths rather than the weaknesses of the urban centres and these are supported as places of potential. This approach has been termed 'proactive'.

A third approach is that followed by programmes which include smaller scale interventions for urban areas (both the urban areas and the interventions). This approach can be referred to, borrowing an expression from the ESDP, as urban-rural partnership. The projects implemented for urban areas in this group of programmes are diversified, ranging from small regeneration projects aimed at re-launching local businesses and trade; cultural infrastructure such as youth centres, museums, theatres etc.; social infrastructure like nurseries etc., all of which aim to improve the standard of living of citizens and the development of communities (e.g. by improving the attractiveness of the regions for tourism). This approach can be exemplified by the SPDs of Toscana (Italy), Niederösterreich (Austria) and Norra (Sweden).

Finally, there are 'non-urban' Structural Funds programmes (eg. Norra Norrland in Sweden, Lombardia in Italy, Nordjylland in Denmark) which are mainly focused on strengthening settlements and improving standards of living. This is often achieved through a diversification of economic opportunities and the provision of essential services to improve the quality of life of local communities. These programmes do not contain interventions for urban areas (direct or indirect).

It should be noted that the three approaches (reactive, proactive and urban-rural partnership) are not mutually exclusive. Indeed, a number of programmes present a mixed approach; for example, in Nordrhein-Westfalen and Sachsen Anhalt, physical regeneration interventions go hand-in-hand with social and cultural investments in urban areas. This having been said, the analysis shows that types of interventions implemented in the current generation of programmes are mainly of a 'reactive nature', i.e. the focus is on the problems and weaknesses of urban areas rather than on their potential as engines for growth, with the notable exception of Finland.

Not surprisingly, the approach adopted in the Structural Funds programmes is often a function of domestic policies. Urban development policies vary across Member States and so varies the way in which urban development is reflected in the Structural Funds programmes (when these include urban development as a policy goal). The degree of variation of urban policies in the Member States is illustrated by the two extreme cases of Germany and Finland. In Germany, policies for urban development are mainly regeneration policies, related to infrastructure investments and implemented through a range of instruments of both federal and Land level; whereas in Finland, polycentric development strategies are in place to ensure a balanced development across the national territory (under, for example, the so called Centre for Expertise and Regional Centre Development Programmes). These approaches are reflected in the operationalisation of European Cohesion policy.

The strategies for urban development in the Structural Funds programmes of the EU10 (2004-06) differ from those of the EU15 countries, reflecting the diverse territorial needs and development priorities. Although spatial problems are significant, by themselves they do not necessarily translate into problems for cities. On the contrary, an "urban advantage" in relation to rural areas, rather than an urban problem, seems to be the general pattern. However, such "urban advantage" has not translated into balanced development of their areas. Some large cities combine wealthy and prosperous areas with areas in decline. Inner parts of the Cypriot capital Nicosia, which is divided by the cease-fire line, have suffered because of the political situation and the decline of tourism. In Malta, there are high environmental pressures due to the extremely high density of population. Czech, Hungarian, Polish and Slovak cities have been affected by dilapidated housing estates, insufficient capacity of roads, heavy pollution, poverty and social exclusion in some districts (Polverari et al 2005, 65).

The new Member States have a more mono-centric structure than the rest of the EU. Only Poland, Czech Republic, Slovakia and Cyprus are not characterized by the dominance of the nation's capital (CEC, DG Regional Policy 2004, 20). The polycentric structure of the latter countries, however, does not necessarily translate into a more balanced development: for example, in both the Czech Republic and Slovakia the two capitals significantly outperform the rest of the country in GDP terms, despite the relative polycentrism in terms of population.

A review of the interventions implemented in the new Member States for urban development under the Structural Funds programmes would be premature, as the programmes started only in 2004. The analysis of the overall strategies, however, suggests that whilst in the EU10 countries, both reactive and proactive approaches to urban development can be found, the reactive approach is underplayed also due to the will to concentrate resources on the areas of potential rather than on those in need. In fact, the programming documents of several new Member States present a growth pole strategy of national economic development. This recognises that urban centres can act as engines of economic growth if high-potential industries within those centres are supported; in other words, support for urban development is considered as a means of developing wider areas rather than as a goal in itself. Such a strategy is mentioned in the documents of those new Member States which have over 2 million inhabitants, starting with Latvia (whose document encourages the development of five economic growth centres), and continuing with Lithuania, Slovakia, Hungary, the Czech Republic and Poland. It seems that in more populous countries of the EU10, a growth pole strategy is necessitated by a country's size. Because population is spread across a relatively large territory, the capital cannot act as the single driver of national development. Other growth centres therefore receive support. This is specifically mentioned, for example, in the Czech Community Support Framework (reference...). Still, growth pole strategies are only tentatively developed in the current programming documents. They appear to support the long-term national goals of strengthening polycentrism where it exists and developing it where it is weak. Examples of proactive approaches can be found in the Czech Republic, Poland and Slovakia.

Having said this, regeneration initiatives can also be found in the new Member States, often as complementary to the growth poles strategy. They feature particularly in Cyprus, the Prague and Bratislava Regions (Czech Republic and Slovakia), but also in Hungary and Poland. In the Czech Republic, two ad hoc Single Programming

Documents operate in the Prague region, coextensive with the municipality of Prague; similarly, in Slovakia the Bratislava region, which covers the City of Bratislava and three additional districts, is supported by two dedicated programming documents. In Hungary, on the other hand, urban regeneration interventions are included in the Operational Programme for Regional Development. The development of marginalised areas is part of the combined approach to urban development in Hungary. The country's Community Support Framework acknowledges the importance of thriving cities as centres of economic growth. It emphasises urban development, including reactive measures to address poverty and urban decline, as preconditions of the success of the growth pole strategy. Similarly, the Local Development Priority of the Polish Integrated Regional Operational Programme aims to support, amongst others, marginalised urban areas.

Territorial cooperation in EU25 Cohesion policy programmes

Territorial cooperation in the EU15 has been funded through a relatively low-profile (financially speaking) programme under the Structural Funds since the early nineties: the Community Initiative INTERREG (see Taylor et al 2005, 17-32 for a historical perspective). In the new Member States prior 2004, territorial cooperation with both EU Member States and external borders was funded by both INTERREG and pre-accession aids (particularly the Phare programme).

Cooperation initiatives are generally considered to have delivered significant benefits, at least by those who have been involved in such programmes. These benefits range from the possibility provided to establish long-lasting networks, to overcome borders, to make European integration more visible, also by means of the facilitation of exchanges of experiences and information with actors in other regions and countries of Europe. Territorial cooperation is also considered to have contributed to raising the role of the regional actor in management and implementation of Structural Funds programmes (see Taylor et al 2005, and Böhme et al 2003 for a review of the benefits associated to territorial cooperation projects).

Experiences of territorial cooperation in the new Member States are relatively recent and it is therefore more difficult to assess the outcomes of such initiatives[9]. Nevertheless, in the early 1990s, some border regions were able to establish closer links within the broader framework of the Euroregions (e.g. Carpathian Euroregion, Danube 21 Euroregion). In the following years, territorial cooperation climbed up the policy agenda in many of these countries, mainly driven by the EU, through the Phare cross-border cooperation programme. The impact and evolution of cooperation initiatives is variable across the new Member States, linked traditions of cooperation, geographical position, level of economic development and the degree of administrative decentralisation in different domestic contexts. For instance, the Baltic countries have been closely involved in Baltic cooperation programmes for an extended period. In contrast, cooperation programmes with non-EU countries to the East have been more problematic to establish. Despite this variation, it is possible to highlight some general trends in the development and implementation

[9] The following paragraphs on territorial cooperation experiences in the new Member States draw on the following reports: Ferry M and Gross F (2005) *The future of territorial cooperation in an enlarged EU*, Paper prepared for the Benchmarking Regional Policy in Europe Conference, Riga, 24-26 April 2005 and Taylor S, Olejniczak K and Bachtler J (2004), *A Study of the Mid-Term Evaluations of INTERREG Programmes for the Programming Period* 2000-06 Final Report to the INTERACT Secretariat, November 2004.

of cooperation programmes that are likely to affect their contribution to territorial cohesion.

The overall objectives of the cooperation projects are relatively general, such as the integration of eligible areas, contributing to the gradual removal of regional disparities as well as the development of regional-level participation, which seems to be especially important in the context of former socialist countries. In practice, the main focus of activity under territorial cooperation has been on the improvement and development of infrastructure in border areas, particularly cross-border infrastructure and border security. More recently, the range of cooperation activities has expanded considerably. Through PHARE-CBC/INTERREG programmes, efforts to improve business cooperation across borders in fields such as the service industry, the tourism sector or innovation, though still quite limited, have intensified. Increasing support has also been provided for capacity building and institutional development based on the establishment of cross-border links between local and regional authorities and NGOs (e.g. Estonia and Latvia).

The implementation and management of territorial cooperation programmes has involved a significant mobilisation of effort in the New Member States and a strong learning component, for example about strategic management and bottom-up, participatory policy making. However, there are a number of difficulties that could constrain the contribution of territorial cooperation programmes to territorial cohesion. In some cases the absorption of funds has tended to be very low. Diverging legal, social and environmental frameworks and standards, as well as the dominant disparities concerning economic welfare make territorial cooperation a problematic issue. A particular problem for the new Member States is that regional authorities or decentralised branches of the central state lack the legal competence, administrative capacity and financial strength to act as proper counterparts for foreign regional partners. Lack of capacity and experience, particularly at the local and regional levels, has meant that in some cases the programming process has become complicated and fragmented, with partners lacking the institutional or financial capacity to become involved in more substantial cooperation activities.

Specific problems arise concerning cooperation between new Member States and third countries, due to the shift of EU borders eastwards. One example is provided by the Baltic Sea Region where programming along the internal EU borders is viewed very favourably, in contrast to difficulties expected concerning the cooperation with the Russian Federation and Belarus.[10]

Urban development and territorial cooperation in 2007-13 Cohesion policy

The uncertainties over the rules of future Cohesion policy, pending approval of the new regulations, make it difficult to predict the weight that urban/polycentric development and territorial cooperation will be acknowledged in future Cohesion policy programmes and, more generally, the broad impact that future Structural Funds programmes might have on territorial cohesion. Member States and regional

[10] For instance, practical problems appear, as the lack of checkpoints and visa-only travel at the Schengen border, are added to the centralism and rigid inter-governmental agreements as well as the difficult access to information. Problems generated by regulatory and funding mismatch add to this already complex situation. The limited harmonisation between funding instruments is seen as having substantially reduced the impact of cross-border cooperation (Special report no 5/99 concerning Phare cross-border cooperation (1994 to 1998), accompanied by the replies of the Commission, *Official Journal of the European Communities*, No C48 of 21 February 2000).

authorities alike are still unclear on the actual priorities that the future programmes will entail and about their relative financial weighting.

Concerning the urban dimension, early indications would seem to suggest a likely shift, for the 'older' EU Member states, now that the major infrastructure deficits have been dealt with, from reactive approaches, to proactive, often innovation-oriented measures (e.g. in Germany). Overall, however, there seem to be mixed views across countries and regions, as to whether urban areas should and will be assisted in future programmes, and as to the likely content of the support to urban areas, both of which will depend on the clarification of fundamental issues such as the level of funding available and the types of eligible activities.

The debate over the Community Strategic Guidelines in Luxembourg exemplifies such degree of variation. While some delegations have expressed satisfaction in relation to the emphasis placed on urban areas in the document (e.g. Hungary); others, for example Denmark, have stressed that Cohesion policy should be focused on the drivers of economic growth (i.e. innovation, information and communication technologies, entrepreneurship and human resources) and that themes such as "environment, equality and regional balance, including development of areas facing structural difficulties and urban themes" should be treated as "cross-cutting issues in one or more priorities" of future programmes (Luxembourg Presidency 2005, 6).

Despite this diversity, three common themes emerge across a number of countries, regarding the role of urban support in future Cohesion policy. First, that urban support should not be equated with urban regeneration. This point is particularly close to the heart of Italian and German authorities. If urban regeneration projects will continue to be implemented under the Cohesion policy umbrella, efforts should be made to ensure the quality and coherence of the projects with the socio-economic goals of the programmes. In other words, the main, overarching goals of Cohesion policy should not be forgotten.

Second, support should not be granted in consideration of the 'urban' localisation of the initiatives per se, but in consideration of the quality of the strategic project-design expressed by local actors and of the nature of the projects. Views along these lines have been gathered from Italy, Germany and France.

Last, and perhaps most important of all, flexibility should be granted to the Member States as regards the selection of the areas that will be supported, the definition of what an urban areas is and the choice to include or exclude urban support from the programmes. There is broad agreement across most Member States on this point, in acknowledgement, for example, of the degree of variation of the definitions of an 'urban area' among the Member States which depend on national administrative and constitutional traditions.

With particular reference to the new Member States, it would appear that the emphasis on areas of potential and on growth poles will continue, at least in some of the countries: in Poland, for example, current policy thinking is orientated towards the further strengthening of metropolitan areas and the funding of transport infrastructure between the main regional centres (Davies and Gross 2005, 18). Early informal exchanges with representatives of some EU10 countries also suggest that, from a thematic point of view, emphasis will be placed on the infrastructure endowment of the regions and, in some cases, on the strengthening

of social and human capital. Current and future approaches to urban development will be heavily influenced by their responses to on-going debates on how to address aggregate national economic growth and interregional inequalities and the merits of equity and efficiency approaches to regional development policy (CEC 2000). For instance, some new Member States have identified an approach focused on growth poles as the most effective means of promoting overall economic growth. The Slovak Republic, for example, emphasises the aim of developing links between Bratislava and other main agglomerations, but also of enhancing the potential of smaller regional centres, and of stabilising the population in rural areas. Similarly, the Czech Republic aims to target growth poles as well as lagging regions, and to support Prague, but also other core agglomerations, and overall balanced development. In Poland, there may be a stronger emphasis on concentrating funding on the main metropolitan areas, as well as on enhancing transport linkages between regional centres (Davies and Gross 2005, 18).

With reference to the second theme under investigation in this paper - territorial cooperation and its likely contribution to increased territorial cohesion - there is broad agreement across the EU25 that initiatives in this field present added-value and that this area of intervention should be retained for the future. Clearly, the policy emphasis placed on different types of territorial cooperation varies across countries: for example, Hungary stresses the importance of cross-border cooperation, particularly with external borders; France supports the idea of the development of long-lasting transnational spaces through 'structuring projects' and the involvement of the Eastern and Southern neighbours in European territorial cooperation (Luxembourg Presidency 2005, 11 and 9).

However, on a more operational level, while territorial cooperation seem to continue to feature highly on the policy agenda of the Commission and (at least some) Member States, despite commitments in principle, the current regulations and strategic guidelines do not seem to solve the typical constraints that have hindered the effectiveness of territorial cooperation in the current programming period, namely: the intangible nature of cooperation outcomes and the difficulty to qualify and quantify the value for money of cooperation projects. Moreover, the complexity, vagueness and lack of proportionality of the bureaucratic requirements associated to cooperation projects is often a constraint, making it difficult, especially for smaller organisations, to be active partners. Communication between partners tends also to be problematic, not just because of the different languages spoken, but also because of the different domestic institutional settings and traditions. All in all, the third Objective of future European Cohesion policy risks continuing to be a multi-purpose and yet relative low-budget priority for future European Cohesion policy. This, matched with the complexity of delivery, leads to serious concerns over the real impact that this type of intervention will contribute to territorial cohesion.

Conclusions

The reshaping of the European Union, of its goals and of those of its Cohesion policy, imposed by the recent and forthcoming enlargements, represent an unprecedented opportunity for the pursuit of territorial cohesion, across and within Member States and regions. However, as discussed in this paper, there are also a number of challenges and practical constraints. These raise questions regarding the effective realisation of this ambitious objective:

- First, the centrality of territorial cohesion to new Cohesion policy has been stressed in a number of documents by the European Commission and subsequent presidencies, but are the necessary conditions in place to ensure that national and regional administrations will be willing and able to fully incorporate measures for this goal into their programmes? Will the policy statements of the National Strategic Documents and Operational Programmes be followed up by concrete policy measures?
- Second, both "old" and "new" Member States will face trade-offs in the allocation of resources to their future Cohesion policies: does the objective of territorial cohesion risk being sidelined, for example to support horizontal/ sectoral themes? Especially with reference to the "new" Member states, will future strategies place emphasis on national development and catching up, to the detriment of sub-national territorial balance? At what level will territorial cohesion be pursued and what coordination mechanisms should be put in place to harmonise efforts?
- Finally, the paper considered two policy fields which are crucial to territorial cohesion: urban/polycentric development and territorial cooperation. However, what weight will actually be attributed to the development of urban centres as centres for growth and to territorial cooperation initiatives in future programmes? And, how will the shortcomings of current policy practice in these two fields (and especially in the area of territorial cooperation) be solved?

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THE GOVERNANCE OF TERRITORIAL AND URBAN POLICIES IN EUROPE

by Joaquín Farinós Dasí

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A European-wide analysis of territorial governance is not an easy task, in particular not when the aim is to present the findings in form of maps covering all 29 countries of the ESPON space. Joaquín Farinós Dasí accepted this challenge and led a team of researchers through an ESPON project which provided interesting findings on territorial governance in Europe. In this article he reflects on the methodological endeavours this project faced and tries to tell this in the light of territorial impact analysis. Indeed, last but not least the governance processes of policies are decisive for their territorial impacts.

Introduction

Territorial Impact Assessment (TIA) refers to a tool or procedure for assessing the impact of proposed spatial development activities in the light of spatial policy objectives. In practice it aims at identifying the positive and negative territorial effects of a policy, plan or programme and it should help to accentuate the positive and to reduce or avoid the negative effects.

This process should be seen as a support to decision-making, and might be of value added for proposals for the development of new pan-European research facilities to assess the effects and potential responses to these effects.

In this context *governance* represents a specific matter in the sense that it *is not a policy but a way of design and concerns different policies* with territorial impact.

TIA covers different scales and aspects of decision-making: macro (the EU), meso (trans-regional, national) and micro (local/regional) scales. But in the case of territorial governance, it is necessary to consider interdependences between levels (multi-level) and between departments and agencies involved (horizontal or cross-sectoral); as well as the phases of policy design and application.

But *which is the most* appropriate level for territorial governance considering the territorial cohesion objective? Taking into consideration the close relations between territorial governance and territorial cohesion, the national level appears as relevant for the coordination of different levels lead by the national interest.

This article provides some methodological reflections on the issue of territorial governance in the light of territorial impact assessments. For the article draws on the experiences of the ESPON project 2.3.2 which analysed territorial governance in Europe.

Firstly the article provides some theoretical background on territorial governance and how to define indicators for measuring territorial governance. This is followed by some methodological considerations regarding quantitative and qualitative analysis of territorial government. Thereafter some general reflections on Territorial

Impact Assessments are provided. Finally the paper presents some results of the analysis carried out by the ESPON Project 2.3.2 before overall conclusions are drawn.

How to define indicators for measuring territorial governance

When looking at governance of territorial and urban policies, the "spatial" context seems to be missing. The ESDP partly fills this gap, assuming that having territorial cohesion as a shared objective, territorial governance can be considered as the tool for achieving development.

Territorial Governance can be seen as a simple application in the urban and territorial field of general principles of governance or, in a more complex and interesting way, not only as a governance process applied to urban and territorial policies, but as a process with specific features as its object is the territory and its aims to regulate and to manage territorial dynamics through the *pilotage* of a multiplicity of actors sharing a common agreed objective (ESPON 2.3.2 project, Second Interim Report, p. 37). As we refer to territorial governance, the target is the territory and the common objective an agreed spatial vision through a process of actors coordinating to develop social, intellectual and political capital. The process of territorial development should be based on a constructive use of territorial specifities in order to improve territorial cohesion at different levels (see ESPON 232 project, Second Interim Report, sections 1.1 and 4.1, p. 9-13 and 30-37).

The challenge of governance is how to create new forms of integration out of fragmentation, and new forms of coherence out of inconsistency. This is particularly relevant in relation to territorial governance, if we consider its potential role in territorial cohesion. In other words, the ESPON 2.3.2 project considers *Territorial Governance as a way to improve Territorial Cohesion*.

The project tried to cover both perspectives: the analysis of governance processes applied to urban and territorial policies and the characterisation of a process with specific features as its object is the territory and the territorial cohesion. For this purpose it was necessary to create an operational definition of territorial governance and an understanding of *Territorial Governance Actions* (TGA).

TGAs put the emphasis on *territorial cohesion* as a key objective. In this context TGA should: 1) facilitate vertical and horizontal co-ordination and co-operation, dealing with subsidiarity, integration (among actors, policies, territories and economic resources), devolution and decentralization 2) foster participation, which means involvement of stakeholders from public, private and voluntary sectors, as well as engagement with civil society, and 3) promote sustainable territorial development and cohesion.

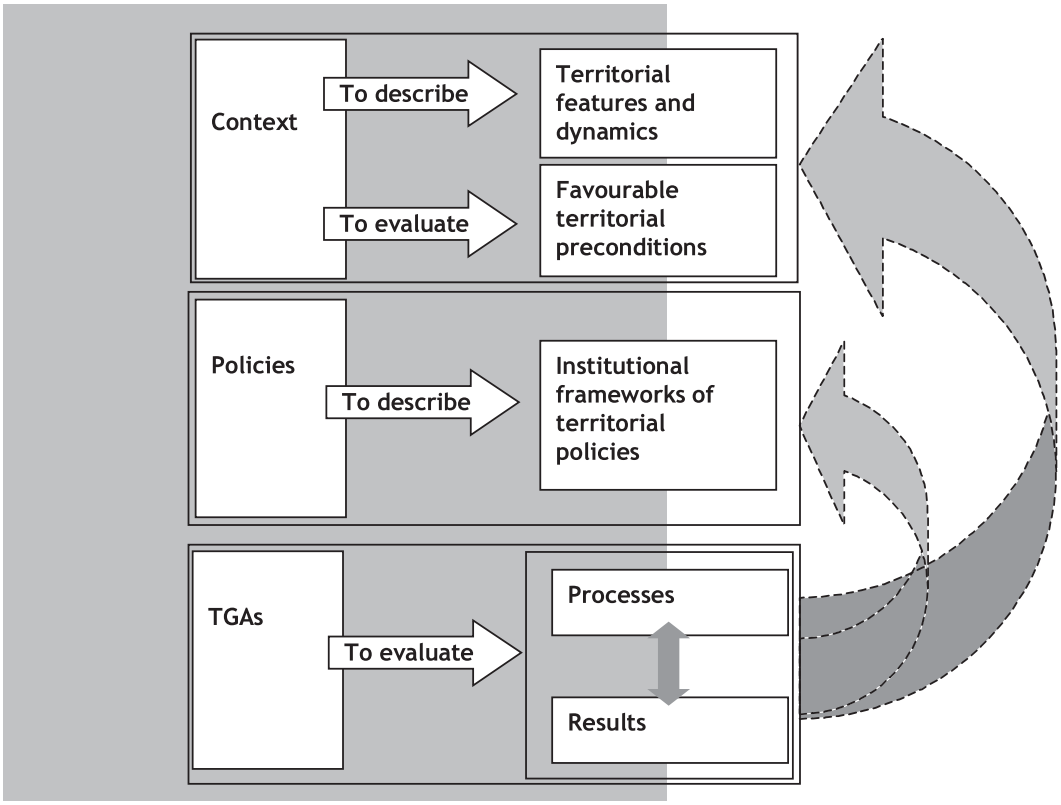
To describe existing governance systems at different spatial levels and to evaluate the effectiveness of their actions it is important to define indicators, data and criteria that refer to the appropriate level. Moreover, territorial governance should be seen as a process rather than a product and/or a joint of preconditions (context or structure). According to this, three types of indicators/criteria were considered, to be used for description and/or evaluation (see Figure 1):

a) *Indicators and criteria of context*: to describe, at the national and sub-national levels, the general structural conditions, features and dynamics of the

territory. To evaluate, mainly in case studies, favourable territorial preconditions to define and implement TGAs.

b) *Indicators and criteria of policies* (both at national and sub-national levels) to describe institutional frameworks of territorial policies, instruments and procedures for governance.

c) *Indicators and criteria of Territorial Governance Actions* to evaluate governance processes and results and their interaction at different levels: if the same processes produce the same or different results, or different processes the same results, and if it is related to other territorial characteristics.



Source: ESPON 232 Project –Second Interim Report, page 35
Figure 1: Types of indicators/criteria

After having defined the indicators which are suitable for describing territorial governance, the challenge is how to populate these indicators with facts and figures.

Some methodological considerations have been identified by the project in order to meet the challenge.

Considerations on the need for a simple and clear method
Simple, clear and understandable indicators and methods assume special value in political debates and in discussions between science and politics approaching political decisions. The most transparent way to describe spatial patterns and regional situations can be achieved by using one single indicator and its regional distribution as the key descriptor. A more sophisticated variant would be the combination of different indicators (bi- or multivariate) using diverse normalisation procedures.

Simple methods – in fact as all methods- have their limits that application of more complex statistical models could solve exploiting the informational contents of data

bases and to test ideas and hypotheses. More complex models such as multivariate statistical analysis based on linear models usually give a stronger scientific base to the analytical work.

But when there is no data available, the less sophisticated approaches are more appropriate and it is also necessary to find other possibilities such as qualitative analysis. That relates directly to the legitimacy and scientific acceptance of methods and results, and leads to the old discussion about usefulness of other methodologies different from quantitative: deductive vs. inductive, quantitative vs. qualitative, hard vs. soft, possibilities to integrate or combine both. This is an important issue for the thematic of this ESPON project.

When data is not available, the use of *Proxy Indicators*, indirect measures of a target, is an alternative to overcome data shortages.

Considerations on the legitimacy of inductive and qualitative methods
Researcher need to articulate the findings in such a way that the logical processes behind their development is understandable to a common reader. The relation between the analytical work and the conclusions on the data need to be explicit through a narrative, and the assertions made in relation to the data set should be credible and convincing. The main elements recognized to distinguish good from poor quality research are: systematic, rigorous, and auditable analytical processes[1].

The strengths and weaknesses of qualitative and quantitative research are topic of numerous discussions in social sciences. It is important also to focus on how the two groups of techniques can be integrated. The same can be said for the division between researchers and decision makers.

The classic methodology, the inductive approach, would be to have a synthesis and to test it building a theoretical framework. Inductive reasoning uses the data to generate ideas (hypothesis generating). In this sense inductive methods tend to create more questions than they give answers. Whereas deductive reasoning, informally called a "top-down" approach, begins with the idea using the data to confirm or negate the idea (hypothesis testing) as it is concerned with testing or confirming hypotheses. In actual practice these two approaches are converging and many quantitative studies involve much inductive reasoning, whereas qualitative analysis requires to be completed from the quantitative side.

In *quantitative* research we classify features, count them, and even construct more complex statistical models in an attempt to explain what is observed. Findings can be generalised to a larger population, and direct comparisons can be made. In a different way, the aim of *qualitative* analysis is a complete, detailed deeper description. So, the two paths present different features (see Table 1). Quantitative analysis is an *idealisation* of the data in some cases, and tends to sideline rare occurrences. The main disadvantage of qualitative approaches is that their findings cannot be extended to wider populations with the same degree of certainty as quantitative analyses can.

[1] Thorne, S. (2000): "Data analysis in qualitative research", Evid. Based Nurs. 3 (3); 68-70. http://ebn.bmjjournals.com/cgi/reprint/3/3/68

Recently there has been a move in social science towards multi-method approaches, and in some cases qualitative analysis has been the precursory step to quantitative analysis.

Qualitative	Quantitative
"All research ultimately has a qualitative grounding" - Donald Campbell	"There's no such thing as qualitative data. Everything is either 1 or 0" - Fred Kerlinger
The aim of qualitative analysis is a complete, detailed description.	In quantitative research we classify features, count them, and construct statistical models in an attempt to explain what is observed.
Recommended during earlier phases of research projects.	Recommended during latter phases of research projects.
Researcher may only know roughly in advance what he/she is looking for.	Researcher knows clearly in advance what he/she is looking for.
The design emerges as the study unfolds.	All aspects of the study are carefully designed before data is collected.
Researcher is the data-gathering instrument.	Researcher uses tools, such as questionnaires or equipment to collect numerical data.
Data is in the form of words, pictures or objects.	Data is in the form of numbers and statistics.
Qualitative data is more 'rich', time consuming, and less able to be generalized.	Quantitative data is more efficient, able to test hypotheses, but may miss contextual detail.
Researcher tends to become subjectively immersed in the subject matter.	Researcher tends to remain objectively separated from the subject matter.

Source: Miles, MB. and Huberman, p. 40
Table 1: Features of Qualitative & Quantitative Research

With sufficient resources quantitative analysis of qualitative data is really powerful (see Table 2). The main bottleneck is the coding of qualitative data to identify themes, attributes or event types.

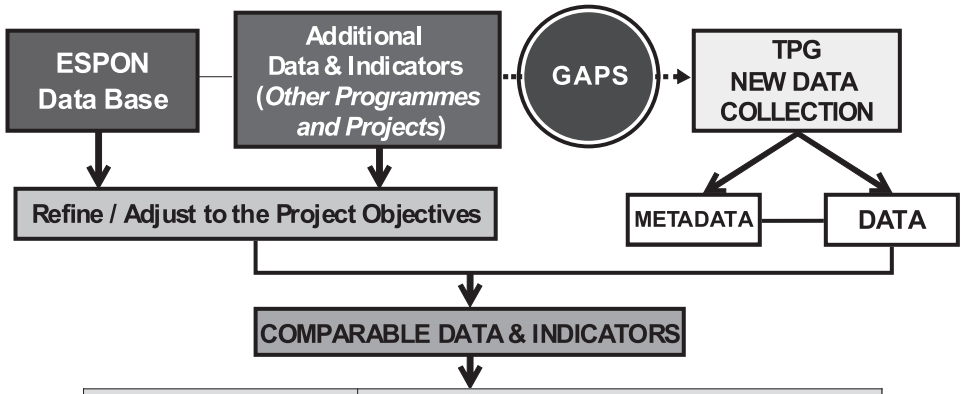
However, there is more than one way in which qualitative and quantitative methods can be combined. *Hybrid approaches* (cf. Schreier in press) comprise a number of phases, some of which are qualitative, others quantitative; however, all of them are necessary for achieving the objectives of the research. In the case of *sequencing approach* qualitative and quantitative methods are used in the same study, although in different phases of the research process. The most common example would be a qualitative phase of data collection followed by a quantitative phase of data analysis.

Considerations on the creation of datasets
All these general considerations come finally to the crucial question of how to apply them in a research project. When doing so, the ESPON 2.3.2 project faced serious data challenges as there were no ready to use European wide data sets and indicators prepared by pervious ESPON projects or other organisations. Thus the project needs to make use of some 'proxy' indicators and other quantitative data derived from qualitative methods.

	Qualitative analysis	Quantitative analysis
Qualitative data	• Literary criticism • Interpretation • Thematic coding • Boolean algebra? • Coding	• Statistical analysis of text frequencies or code co-occurrence
Quantitative data	• Interpretation of statistical results • Graphical displays of data • Naming factors/clusters in factor analysis & cluster analysis	• Standard statistics (e.g. regression) • Multivariate methods

Source: Adapted from: http://www.analytictech.com/geneva97/whatis.htm
Table 2: Combining Types of Data and of Analysis

To start with a detailed list of general indicators (on state, economy and civil society, both referred to structure and process) had been elaborated, relating them with the five principles of good governance accordingly to the White Paper on European Governance[2] (cf. Figure 2 and Table 3).



		Domain			
		State (S)	Economy (E)	Civil Society (CS)	Space (*) (T)
Feature	Structure (S)	ISS	IES	ICSS	ITS
	Process (P)	ISP	IEP	ICSP	ITP

Figure 2: Looking for Data and Indicators

Following the structure presented in the figures, eight indicator fields have been identified for the description of territorial governance. These have been further detailed and for each field suitable indicators and datasets have been identified:

[2] CEC - Commission of the European Communities (2001): European Governance: A White Paper, Communication from the Commission, COM(2001) 428, Brussels. http://europa.eu.int/eur-lex/lex/ LexUriServ/ site/en/com/2001/com2001_0428en01.pdf

	Domain	Principle of good governance
State		
ISS	Employment total, NACE L-P, Population, Budget figures. Qualitative side: TRUST 1 [includes World Bank surveys on legal system, government, national democracy, parties, parliament]	Effectiveness
ISP	Delta(*) for Employment, L-P, Population, budget figures. Qualitative side TRUST 2 [includes World Bank surveys on government effectiveness (only indicator available as time series and for 29 countries), regulatory quality, e-government contact for SME (both indicators have gaps, more than half of the countries show no data); internet users per household (ESPON Ddatabase)]	Effectiveness
Economy		
IES	GDP/GVA, HQ [head quarter function for MEGA, urban audit], Service Society (specific services). Data in part from ESPON Database or Eurostat – partly to be collected; problem of area coverage.	Effectiveness
IEP	Delta for GDP/GVA; delta for other indicators.	Effectiveness
	Regulatory burden Index [NUTS 0]	Accountability
Civil Society		
ICSS	QUALI 1 to describe the current situation [with respect to spatial planning; data from NOs]	Participation Openness
ICSP	QUALI 2 [data from the Numeric Approach in the case studies]	Partic. / Open.
Space**		
ITS	Pentagon, Polycentricity, Settlement Structure, FUA, Urban-rural typology – all ESPON Database – existing data; area coverage a problem.	Coherence
ITP	Lagging regions, multi modal accessibility, MEGA – all ESPON Database - existing data; area coverage a problem.	Relations

(*) Delta valuates difference between two data or two reference points)
(**) The indicators on spatial aspects are used to further differentiate the regional situation.

Source: IRPUD
Table 3: Starting Set of Indicators

By combining the structural with the dynamic indicators following typology of regions should be achieved.

Data on	Indicator on	
ISS & IST & IES & ICSS	→ Structure	
		Typology
ISP & ITP & IEP & ICSP	→ Dynamics	

Table 4: Combination of structural and dynamic indicators

In order to complement the information from European wide data analysis, a series of cases studies has been carried out. These focused on the territorial features of governance issues, provided more detailed knowledge on territorial governance actions, indicators and criteria. Furthermore they also helped to evaluate (favourable) territorial preconditions for governance. In this way the project combined quantitative and qualitative methods through positive feedback: Collecting and processing proxy indicators coming from external sources (see Table 2), extracting them from the national overviews (complied for every country) regarding context for territorial governance actions (transformation of qualitative in quantitative info) and trying to relate preconditions with results of territorial governance actions through cases study (see Figure 3).

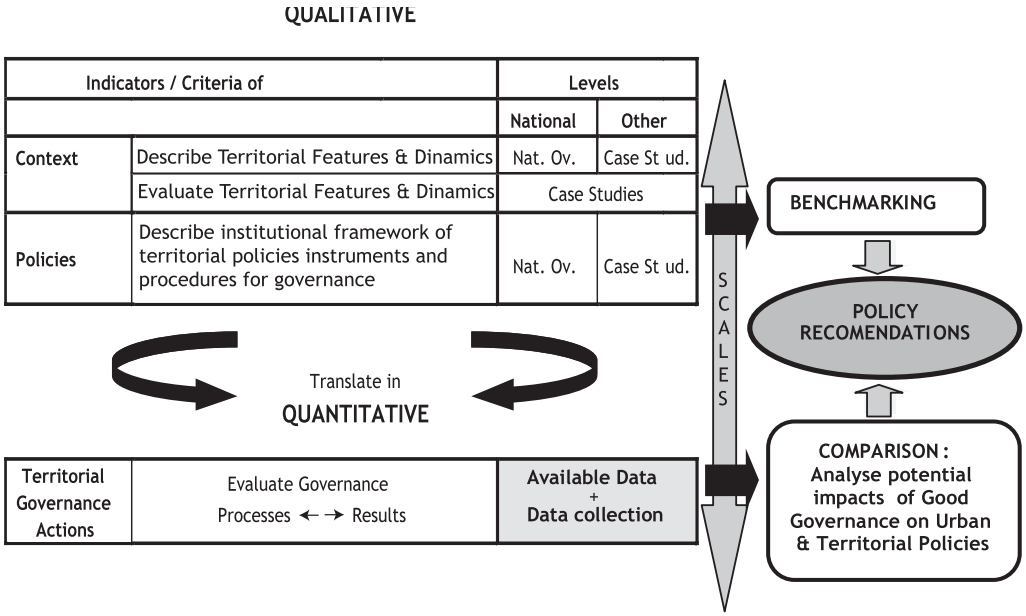


Figure 3: Combining Qualitative / Quantitative Approaches

Results of an analysis of territorial governance in Europe

In the ESPON project 2.3.2 inductive methods were used instead of deductive methods. We follow this approach as there is not enough theory to support this thematic. As a pioneering project it was our task to build a theory concerning governance and territorial cohesion. The project required a certain amount of flexibility in this sense. However with the limited resources and time available we also had to follow a pragmatic path and could just make a first exploration and explore a few new roads.

Urban and territorial governance, or in other words, the interpretation of urban and territorial policies as governance actions, represent a very specific field of research because they depend on the specificities of each territory. In territorial related issues correlations, or relations between cause and effect, could be re-interpreted, as was already recognized in Terms of Reference document for 2.3.2 ESPON project *"…In any case, good governance is partly to be assessed on a territory-basis. It cannot be done on the basis of one-size-fits-all model, but rather on the basis of existing situation. Each coordination/cooperation process has its underlying sectoral or territorial dynamic, logic, and constraints. In that respect, an efficient assessment implies to adopt in a certain measure a case by case approach."* (p. 12)

Certainly it is difficult to define an 'a priori' hypothesis, in the sense of cause-effect relations, for a thematic such as governance. It is not possible, and not even convenient, to 'encapsulate' governance 'a priori'. This peculiarity makes an inductive/qualitative approach especially appropriate, also because it allows to learn in a comparative way about best practices, about the reasons of good examples, as well as of failures, and explores the possibility to transfer them to other ESPON spaces. From this point of view the national overviews and case studies constituted, as sequential steps, the way in which we explored the three dimensions of territorial governance: understood as structure (or preconditions for governance), as process (governance actions) and as results of these actions.

Mapping territorial governance in Europe

The main source of data is qualitative data from National Overviews. Guidelines and structure for national overviews were specifically designed in order to make a characterisation of the situation in the ESPON space (29 countries) and to test the hypothesis of a possible and convenient review of the *European Compendium of Spatial Planning* Document. As there was no updated report of the actual situation on territorial governance available, the project started by scanning definitions in all countries.

29 national overviews, divided into two parts, were produced following a pre-determined structure. Part I relates to the Institutional Context (country profile, general institutional structure of government, the general system of governance – with a total of 10 sub-headings) and Part II focuses on Territorial Governance (territorial competencies and responsibilities, cross-border and transnational cooperation, instruments for spatial planning and policies with territorial effects, processes for spatial planning, approaches for horizontal and vertical cooperation and coordination, final comments and case studies proposal – with a total of 26 sub-headings)[3].

In order to be able to analyse and compare this vast amount of data (36 first level sub-headings) information from the national overviews was exploited and organized in a systematized way. As a result a Synthesis Report was elaborated and finally national information (tested in a second round with national experts) was placed by countries into a matrix. This matrix was the starting point for mapping (see Figure 4). Using qualitative indicators, the project worked towards basic maps representing the existing regional structures and aspects, considered important for

[3] See ESPON 2.3.2, Chapter 4, p. 84-97

'governance'. The data complied for the maps were double checked by using the case studies and the discussion with experts.

For this first map, ten indicators extracted from the national overviews were considered: 1) official acceptance of governance and principles, 2) changes in formal government in the direction of governance, 3) Experience with participation processes, 4) experience with partnerships, 5) extent of financial dependence of local government on central government, 6) devolution of powers to 1st tier local authorities, 7) centralization / decentralization / devolution, 8) number of conditions leading to shifts towards governance, 9) number of factors operating in favour of adoption of governance approaches, 10) number of forms of cross-border co-operation.

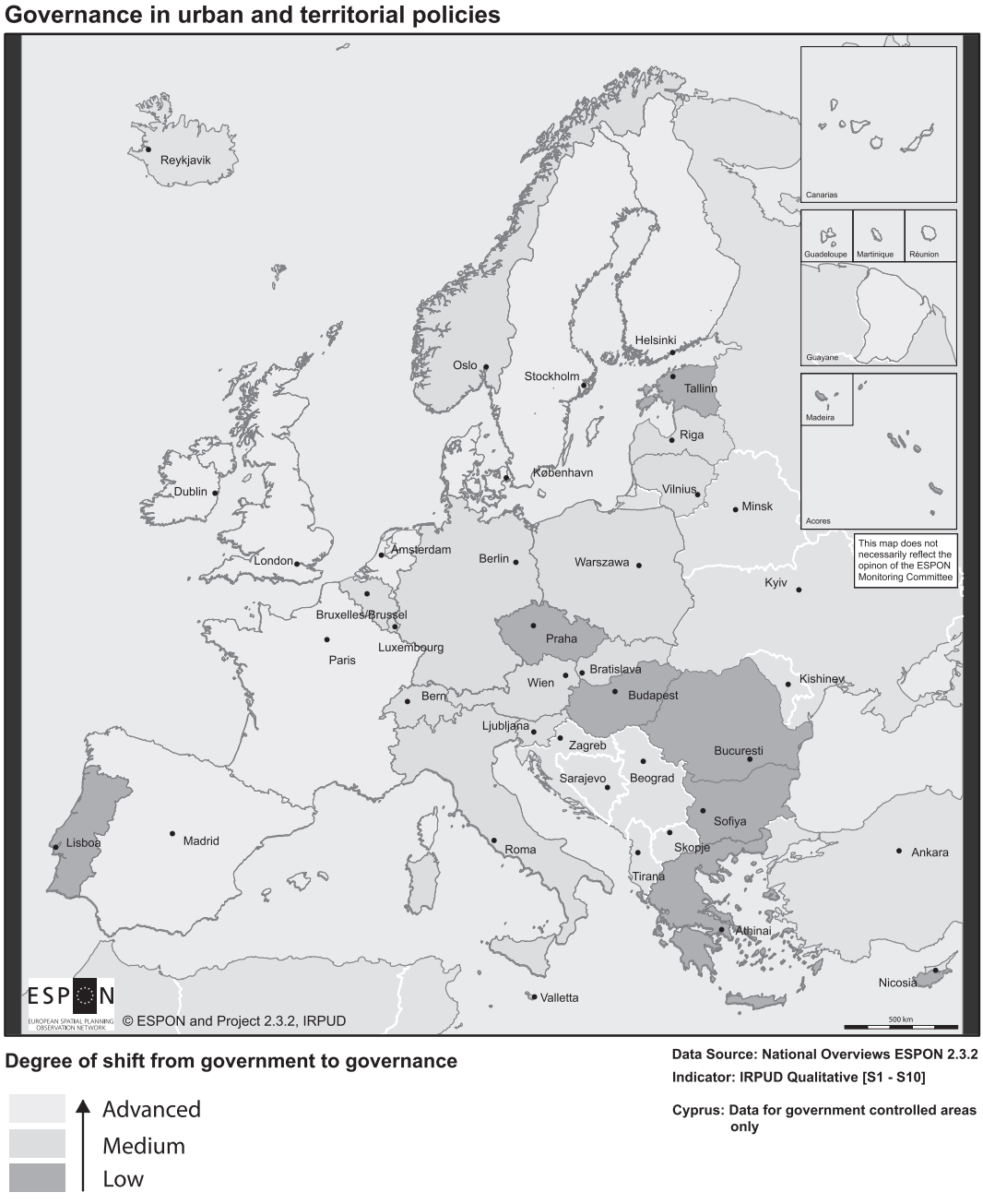


Figure 4: Territorial Governance. National Qualitative Typification

The qualitative information collected on these indicators was then translated into numeric tables, given scores, and weighted in order to generate "national scores". The resulting scores have displayed the three groups of countries shown in the map.

Case studies
In addition, a series of case studies has been carried out covering all geographical scales (transnational/cross-border, national, regional and local levels – intra-urban, also between city and its hinterland) and policy tradition styles (in fact all countries will be represented). The case studies (53 in total) served the purpose to shed some light on the causes and the impact of 'good' governance in the field of urban and territorial policies. Exploitation of national overviews allows to extract some conclusions about national situation regarding:

- Changes in formal government in the direction of governance
- Priority emphasis on governance objectives as indicated in NO
- Conditions leading to shifts towards governance: Positive elements are:
    - long tradition of "working together" and citizens' participation,
    - innovations in the field of partnership creation,
    - reorganization of spatial planning system and
    - introduction of new instruments and agencies
- Catalysts and barriers to changes to governance:
    - Examples of catalysts:
        - fiscal crisis of central state
        - limited territorial competence of Local Authorities
        - spatial conflicts and environmental pressures calling for multi-sector policies and conflict resolution'
        - long tradition in public participation and partnerships
- Examples of barriers:
    - limited funds and legal powers of partnerships
    - reluctance to share power
    - antagonisms and communication problems between participants

These issues, as well as the five principles of good governance, have been considered in the guidelines for the case studies and data collection requirements.

The case studies on governance practices and processes have been analysed from two different points of view: the vertical and the horizontal relations at work. This reflected the institutions and formal structures, as well as the understanding of relations and interconnections between level and actors.

This analysis allowed additional insights on the mechanisms of territorial governance and helped to complement the picture deriving from the overall analysis.

Conclusions
Urban and territorial governance represent a very particular field of research because it depends on the specific character of each territory. It is an ambitious aim of research to find relations between territorial governance and territorial cohesion, improving territorial capital, a precondition also as a result of territorial governance actions. In addition, the project has to deal with the challenge of considering all levels, from EU to local, and their interrelations; it has to combine ambitious objectives with limited resources and big scarcity of directly addressed data and indicators.

In territorial matters correlations, or relations between cause and effect, could be re-interpreted. Certainly it is difficult to define an 'a priori' hypothesis, in the sense of cause-effect relations for a case such as governance. This particular condition, also as the objective of benchmarking in order to learn about reasons of good and failed examples and their possible transferability along ESPON space, makes an inductive/qualitative approach especially appropriate. We use inductive methods instead of deductive methods and follow these rules, because there is not enough theory yet. It is our task as a pioneering project to use the experience we are gaining as a source and base to help build the theory concerning governance and territorial cohesion. From this point of view national overview and case studies constitute, as sequential steps, the way in which we try to know territorial governance in its three dimensions: as structure (or preconditions for governance), as process and as results.

The above referred scarcity of data and indicators, also as the specific nature of territorial governance, made it necessary to explore new methods and ways to collect qualitative data (through national overviews and case study, cf. Figure 3). This qualitative info was transformed and combined with quantitative indicators (see Figure 5). In order to avoid 'crackpots', the result of this process was checked using other indicators from external sources (Eurostat, Eurobarometer, World Bank, Committee of Regions…– cf. Third Interim Report of ESPON 2.3.2 project, Annex 2, Table 8.4, p. 138-141) as well as other ESPON projects as 1.1.1, 2.4.2 and 3.3. As the project demonstrates (Salzburg ESPON 2.3.2 project presentation, March 2006), results from qualitative indicators coming from different sources are in tune.

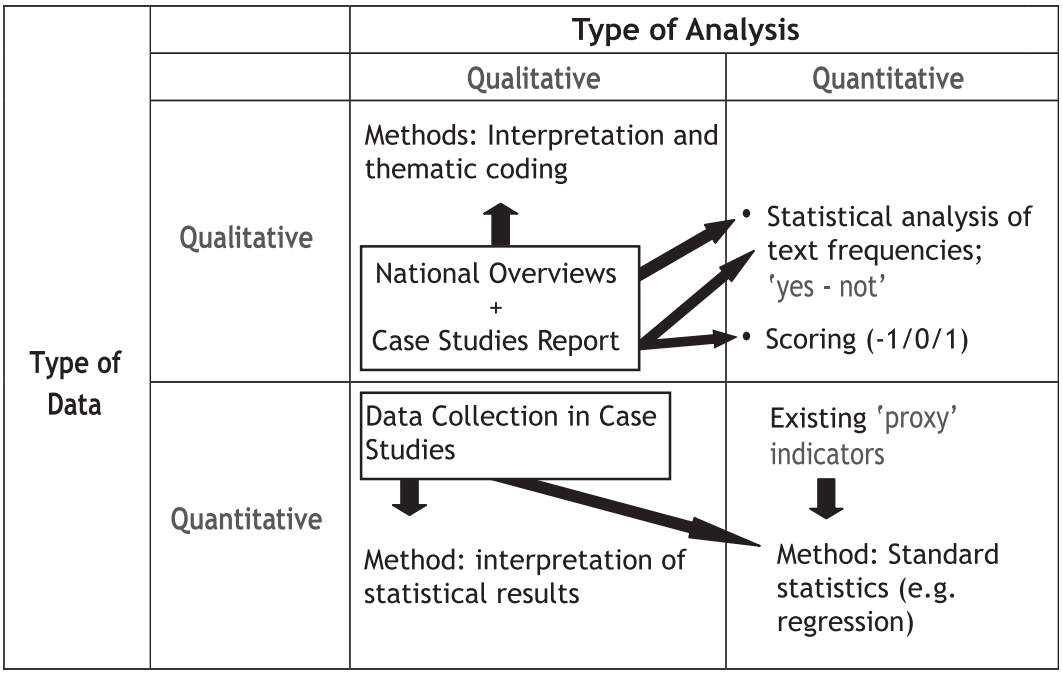


Figure 5: Combining qualitative and quantitative methods & data

These external sources were combined with qualitative information from 232 National Overviews, in order to define the pre-conditions of territorial governance -vertical and horizontal- and context -political context and nature of territorial policies. In addition, deeper analysis is developed in case studies, focused on territorial governance actions; both in policy design and implementation phases, and in the different geographical levels. This was considered the best way to

identify reasons of success – also as failures – and learn about best practices, extracting conclusions on such territorial based actions.

Precisely, one of the most important constraints in data collection was the difficulty to obtain data and create indicators on territorial governance at lower than NUTS 0 level. In fact it was possible to characterize processes of regionalisation and types of regions, as well as spatial planning styles and competences at different levels; but it was not possible to cover the full variety of indicative cases and types of governance actions along ESPON space. Each case study is characterized by a series of pre-conditions (context and policies –see Figure 1). It has to be considered that case study selection was not random, but focussed on successful practices. In fact this strategy should not only allow to analyse territorial trends but also develop a qualitative territorial impact assessment.

As a final recommendation, and in order to enable other TIAs, more work on data collection and development of specific indicators for territorial governance at sub-national level appears very necessary. The specific collection of data and the generation of indicators for the various governance aspects should be considered in future ESPON rounds.

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GOVERNANCE AND POLYCENTRIC URBAN DEVELOPMENT: THE TERRITORIAL AND POLITICAL TRANSLATION OF SPATIAL IDEAS

by Tim Richardson & Gordon Dabinett

Tim Richardson is Professor Ajungeret at Aalborg University, Denmark. His research explores how dominant ideas emerge in spatial planning, and how the institutionalisation of these ideas in planning practice frames the possibilities of thought, communication and action.

Gordon Dabinett is a Reader in Town & Regional Planning at the University of Sheffield, UK, and specialises in the study of spatial justice and uneven development in Europe. He is also currently involved with an EU INTERREG project examining the role of integrated spatial planning in revitalising city centres in the North Sea Region, and is an Honorary Vice-Chair of the Regional Studies Association.

Tim Richardson & Gordon Dabinett explore in this paper how transnational spatial policy ideas are given particular, situated meanings as they are contested and embedded within territorial governance settings. This situated approach opens up new perspectives on Territorial Impact Assessment of spatial policies. The introduction, definition and application of 'polycentric urban development' in the course of preparing the South Yorkshire Spatial Study, in an urban sub-region of the UK, is compared with ESPON's more analytically 'pure' version. The paper identifies and reflects on a gap between these macro-analytical and bottom up micro-political views of polycentric urban development, and suggests a need for research including meta-analysis to bridge the gap between these two perspectives.

Introduction

> "Oui au polycentrisme et non à la banane bleue qui génère trop de disparités entre le centre et les périphéries, tel devrait être le slogan de tous les aménageurs européens." (Yes to polycentrism and no to the Blue Banana that generates too many disparities between the centre and the periphery, this should be the slogan of all European planners). (Guigou, 2002: , cited in Faludi 2005)
>
> "In sum, the storyline of polycentricity continues to hold something in stock for everyone, which means that EU decision-makers wishing to justify high-speed rail connections between national capitals are as justified to do so in the name of polycentric urban development as are regional policy-makers arguing for improved road connections between secondary cities." (Peters, 2003: 328)

Since the publication of the ESDP, the spatial policy idea of polycentricity has come to occupy a dominant position in debates about European spatial policy and planning. In the ESDP itself, the notion of polycentricity could be regarded as being fuzzy and ill defined, but the application of the ESDP has seen parallel streams of activity as this apparently fuzzy concept has been subject to scientific analysis and (simultaneously) applied in diverse multi-scalar planning settings. This paper seeks to open up a debate about the differences between 'polycentricity' as it is being shaped through ESPON's programme of scientific analysis, and 'polycentricity' as it is being operationalised in everyday planning contexts. This act of opening up an analytical gap between macro-analytical and micro-political research serves to illustrate how a situated analysis can enrich understanding of the impact of European spatial policies, and shed light on how spatial ideas relate to the multi-scalar contexts within which they are translated and implemented.

The first part of the paper, then, explores how such transnational spatial policy ideas are given particular, situated meanings as they are contested and embedded

within territorial governance settings. In particular, how does the policy idea of 'polycentric urban development' undergo moments of translation as it becomes embedded in planning events at different scales? We look to see whether at these critical moments of situated micro-politics, the idea of polycentricity itself becomes malleable and contestable. The paper takes a single case study as its focus: the introduction, definition and application of 'polycentric urban development' in the course of preparing the South Yorkshire Spatial Study, in an urban sub-region of the UK.

The second part of the paper goes on to briefly outline how the ESPON research programme seeks to generate a more analytically 'pure' version of polycentric urban development (though for the purposes of this paper it will be assumed that the audience has some familiarity with the ESPON work). Finally, the paper examines the relations between these top-down macro-analytical and bottom up micro-political views of polycentric urban development, revealing significant gaps between the analytical and practical mobilisations of the policy idea. In conclusion, we suggest a need for research including meta-analysis to address the gap between these two perspectives.

The paper builds on previous work by the authors which seeks to understand how spatial ideas are generated and reproduced across territorial governance environments (e.g. Böhme et al., 2004: ; Jensen and Richardson, 2004: ; Dabinett and Richardson, 2005). In particular, we are concerned to debate how analysis of territorial governance can give meaning to the impacts on lives and places of policy ideas that seek to engage with uneven development.

Rather than attempting to analyse these issues at a geopolitical scale, the focus here is on the micropolitics and little practices of policy making upon which the fate of such big ideas rely. The specific aim is to scrutinise the calculative practices that appear to play a crucial part in legitimising the spatial policy discourses and practices that reproduce the policy idea of polycentric urban development. Following Scott (1998) this is done by unearthing the thin simplifications through which space is analytically captured and articulated in policy spaces.

The politics of spatial analysis

But there is a further politics tied up in spatial analysis, particularly where the aim of the analysis is to generate or legitimise common action among powerful interests. The products of analytical tools can resemble frozen politics (Flyvbjerg, 1998) in that they capture and crystallise the balance of power at a particular moment. In such cases, following Throgmorton (1992), the persuasive power of techniques of analysis becomes immensely important, but this persuasiveness has an ambivalent potential. Mapping the impacts of proposed policies cannot be understood as a value neutral activity.

This raises a series of difficult issues: the quest for analytical precision, which may be shared by those developing new spatial tools and objects of analysis, may be in tension with a desire for more 'flexible' criteria which are open to interpretation and therefore more politically useful. As Faludi has cogently argued, the politics of consensus-seeking in EU policy debates has not always been smoothed by the new spatial analysis: 'Razor-sharp criteria are not always helpful in achieving agreement' (Faludi, 2005: 5). So actors engaged in spatial analysis occupy a stage where their politically sensitive work must play to contrasting audiences seeking both

subjectivity and rigour. In analysing this field of activity it is therefore important to engage with both the precise calculative framing and representation of space in for example maps, images, or statistics, and the rhetorical significance of these representations in the mobilisation of policy discourses.

At the heart of this discussion, following the work of, for example Stuart Elden, is the idea of calculation as being constitutive of how we have a world that we can live in - of how we order space, but also how we conceive of space, and of population. New approaches to calculation of territory can be seen in this light as reconstituting European space. If calculation is the key, can we deconstruct the calculation of EU space to understand how new limits are being imposed on what it is to be European / on European territories. New forms of governance might be thought about in terms of how they seek to order European space through new techniques of calculation.

Scott (1998) has developed an incisive vocabulary for analysing these techniques of governmentality. He argues that effective governmentality depends on an ability to forge tools of legibility, which render visible the territory and its population (p25). This requires the systematic creation of stylized facts referred to as 'thin simplifications' (p309). Spatial analysis can be seen as playing a potentially important role in generating such simplifications, as space is reduced to elements which are measurable across 29 member states. The activities of spatial research communities and networks, such as ESPON (the European Spatial Planning Observation Network) are, from this perspective, revealed as significant players. Simplification may be an inescapable dimension of possible government, it is nevertheless important to raise continuous questions about the risks of thin simplifications, since their creation can lead to dangerous oversights. What, then, are the possible dangers of the thin simplification of European space?

The South Yorkshire Spatial Study 2002-3

This detailed case study of how policy ideas are translated within specific governance settings, examines the interpretation of polycentric urban development as a normative construct rather than as an analytical one (Davoudi 2003: ; Parr, 2004), and at a micro-level (Nordregio) within the UK. At the time of these policy processes, polycentric urban development was not otherwise contained or referred to in any planning guidance or formal planning statements. Studies were beginning to emerge (Ecotec, 2000: ; Hague and Kirk, 2003: ; Turok and Bailey, 2004), but more generally, discourses and practices in British strategic planning exhibited a high degree of 'Euroscepticism' (Shaw and Nadin, 2000: ; Tewdwr-Jones et al., 2000).

The first introduction of polycentric urban development as a spatial idea can be traced to July 2002, when the private planning consultants AMION Consulting were appointed by the South Yorkshire Forum to undertake a spatial study of the sub-region (Dabinett & Richardson 2005).

South Yorkshire is an EU NUTS II area within the UK standard region of Yorkshire and Humber, awarded Objective 1 status for the 2000-2006 period. This sub-region has had no single formal democratic or administrative body since 1986 when the South Yorkshire County Council was abolished by the national government of the day. Local government at the time of the study was the responsibility of four unitary urban local authorities: Sheffield City Council and the three borough councils of Barnsley, Doncaster, and Rotherham (see Figure 1). The South Yorkshire Forum was a

partnership led by these four municipalities, but also involved representatives from local businesses, educational institutions, health authorities, police, the regional development agency, other statutory agencies and various community groups.

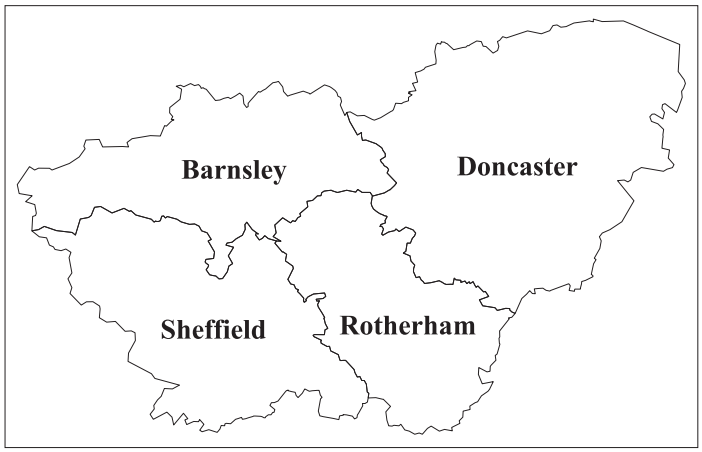


Figure 1: The four local authorities in South Yorkshire

The urban form of South Yorkshire consisted of the city of Sheffield, the three smaller urban centres of Barnsley, Doncaster and Rotherham, other towns and villages, and the 'Dearne Valley', the former coalfield at the geographical centre of the sub-region (see Table 1). The coal mining areas were characterized by a unique settlement pattern of "small towns and villages around former pit-head locations, dispersed according to geology of the coal seams" (GOYH 2001). Although generally regarded as an urban concentration, a perception reinforced by 70% of employment being concentrated in the urban cores (see Table 1), over two-thirds of the sub-region's area was rural, with flatlands in the east rising towards the hills and moorland in the west and to the fringes of the Peak District National Park.

Much of the land surrounding the main urban and coalfield areas was designated either as green belt or (in part) national park, long-standing planning statuses that severely restricted new building in an attempt to conserve environmental and landscape assets and to contain the worst aspects of urban-sprawl. This need for containment is illustrated by the situation where the urban cores only contained 47% of the population, with 30% residing in towns and villages found in the urban hinterland (see Table 1). The 1980s and 1990s also saw new urban development that was largely characterized by edge-of-town retail, leisure and employment uses and the suburban expansion of new housing areas.

In response to the dramatic decline of the South Yorkshire economy during the 1980s and 1990s, resulting from restructuring in the coal and steel sectors, the key sub-regional partners came together on a voluntary basis to create the South Yorkshire Forum, to oversee the regeneration of the area. It commissioned a major study in 1999, consisting of an economic analysis and a 10 year strategy for creating a step change in the fortunes of South Yorkshire - 'to create a balanced, diverse and sustainable high growth economy' (PwC 1998). This framework underpinned the subsequent EU Objective 1 Programme for the sub-region and informed the preparation of the first Regional Economic Strategy prepared by the regional development agency set up in 1999, Yorkshire Forward. It however failed to address the spatial context within which regeneration was to take place. The South Yorkshire Vision also preceded the preparation of Regional Planning Guidance by central

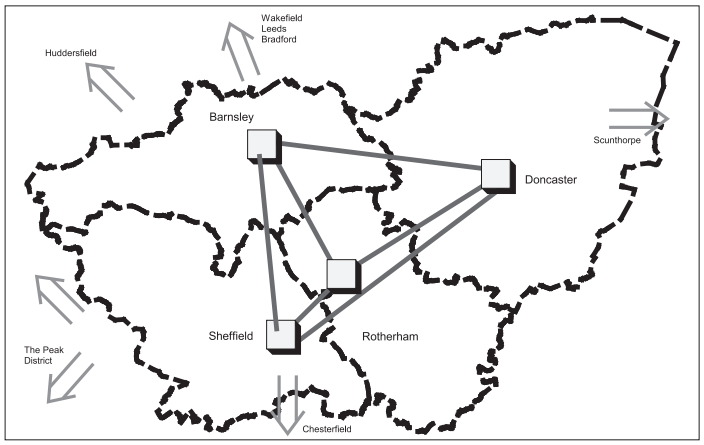
government, which itself was not at all specific about the spatial form of development in South Yorkshire (Baker, 1998), other than broadly highlighting the Dearne Valley coalfield as a strategic site for economic regeneration.

Spatial Area	Employment Numbers 1998	% of South Yorkshire	Population Numbers 1998	% of South Yorkshire
All South Yorkshire	449,700	100	1,304,500	100
All Urban Cores	317,200	70	616,000	47
Barnsley Core.	*35,100*	*8*	*82,900*	*6*
Doncaster Core	*55,500*	*12*	*96,300*	*7*
Rotherham Core	*44,300*	*10*	*93,600*	*7*
Sheffield Core	*182,000*	*40*	*343,900*	*26*
Dearne Valley Coalfields	28,000	6	146,400	11
Outlying Towns and Villages	54,700	12	252,700	19

Source: ONS, Author's own figures. All data rounded
Table 1: South Yorkshire Population and Employment Distribution, 1998

Consequently, the terms of reference for the consultants saw the spatial study helping to 'model the optimal spatial development pattern for South Yorkshire and define more clearly the roles of the different parts of the sub-region, their inter-relationships and relationships with areas adjacent to South Yorkshire… The intention is to identify key roles and responsibilities for each of the districts within the framework of a 'polycentric model'… and a key objective for the project is to determine how their future economic relationships can become mutually reinforcing" (South Yorkshire Forum, 2002: 1-3 and see figure 2). The study was undertaken over eight months, with the final report from the consultants being agreed in March 2003 April. The concept of polycentric urban development made an explicit and full reference to the ESDP in the consultant's brief and their final report, and was reinforced in focus group presentations to stakeholders in the sub-region, and in oral and written reports to the Steering Group overseeing the Study.

Thus, the main purpose of the South Yorkshire Spatial Study (SYSS) was seen to be to clarify options for the sub-region's future economic role, based on a 'polycentric' approach to regenerating areas (South Yorkshire Forum, 2001). To this end the SYSS developed six alternative 'strategic spatial frameworks' - South Yorkshire Now, Mono-centric, Bi-polar, Polycentric, Polycentric Plus, and the Dearne-Don Axis (see Table 2 and Figure 6). Each framework was assessed against common criteria, but the study did not support a particular option other than advocating the need for change. In considering the findings of the study, the Leaders and Chief Executives of the four local authorities came to a view in 2003 that future work should be carried out focusing on the Bi-polar and Polycentric spatial propositions, but little direct action followed this position. However, 'polycentric' spatial thinking was to be incorporated into later formulation of spatial policies - in particular the regional spatial strategy for Yorkshire and the Humber (Government Office for Yorkshire and the Humber, 2004) and 'The Northern Way' that covered the three northern standard regions of England (Northern Way Steering Group, 2004).



Source: SYF 2002
Figure 2: Polycentric development: South Yorkshire Spatial Study Consultant's Brief

	Basic Summary of Spatial Developments
South Yorkshire Now	Development would continue within existing policies, distributing growth across the sub-region, with new development steered towards the four urban centres of Sheffield, Rotherham, Barnsley and Doncaster, and the three Strategic Economic Zones in the Dearne Valley and around the M1 Motorway and M18 Motorway corridors. Little or no functional seperation or uniqueness established between these seven areas.
Mono-centric	Future development would be focused on the 'Sheffield city-region'. New growth to be steered towards the Sheffield and Rotherham cores, seen as a co-terminous spatial area. Transport to promote access to and around this city-centred spatial form. Other areas seen in dependent functional relationship with the city core.
Bi-polar	Future growth would be directed towards the Sheffield-Rotherham city core and Doncaster urban core. These two urban areas were seen to offer distinctive but complementary economic functions. The former would be based on 'knowledge and advanced manufacturing' activities, the later on logistics activities and the planned renaissance of Doncaster as a 'regional city'.
Polycentric	Development to be concentrated in the four urban cores of Sheffield, Rotherham, Barnsley and Doncaster, with an 'environmental zone' designated in the Dearne Valley, and development restricted in this area. Each center would be able to establish and fulfill a distinctive and complementary economic function within the sub-region. High levels of accessibility by public and private transport between these centres.
Polycentric Plus	Essentially the same as above, but the strategic environmental zone in the coalfields replaced by a sustainable urban zone in the Dearne Valley area, creating five key urban centres.
Don-Dearne Axis	Future growth would be directed towards a linear corridor, which at one end would have the city-core of Sheffield/Rotherham, and at the other end the city core of Doncaster/Finningley airport. The corridor would extend between these centres through the southern coalfield towns of the Dearne and brownfield areas of Rotherham. Could ultimately link west and east to Liverpool/Manchester and Humberside ports.

Table 2: Summary of the South Yorkshire Spatial Study Strategic Frameworks

Polycentric Urban Development and Spatial Meanings
The process by which the South Yorkshire Spatial study was prepared can be viewed as a number of sequential stages. Whilst these were not entirely discrete in practice, they do identify and highlight points at which those involved with the study had to give spatial interpretations and meanings to the broad policy idea underlying the study, polycentric urban development. These six stages are summarised in Figure 3, and the 'spatial representation' of South Yorkshire in each is explored further by considering different representations through meanings attached to:

a) spatial scale and the definition of boundaries;
b) The role of urban centres;
c) The urban-rural relationship; and
d) Connectivity.

Scale and boundaries
A continual tension within the South Yorkshire Spatial Study was the degree to which the spatialisation of polycentric urban development should be restricted in its meaning and interpretation to the micro-level of South Yorkshire only, or should encompass a wider urbanised region, or even emphasise the linkages of South Yorkshire to wider spatial scales of the U.K. or Europe. Indeed, the Consultant's Brief made reference to a wider spatial interpretation of polycentricity, and the Consultant's report makes reference to the adjoining urban regions to South Yorkshire. However, the predominant imagery, analysis and interpretation of South Yorkshire were all a political and administrative construct, built out of the boundaries of the five local authorities, the 'old' South Yorkshire administrative area, and the current Objective 1 operational spatial unit defined by the EU NUTSII nomenclature. The 'five propositions' mapping showed the permeability of the border by highlighting major routes of transport connectivity, but did not provide any imagery of the adjoining urban regions or cities, which included the major settlements of Leeds, Manchester, Nottingham, and Derby.

It could be suggested that the study had to use such immediate political and administrative constructs to gain legitimacy in its intended role to influence future decisions about the allocation of resources, and to shape the formulation of future policies. Political will secured through the voluntary collaboration of the five local authorities constituting the South Yorkshire Forum was always a fragile arrangement. Consequently, extending future possible collaboration beyond the existing political/ administrative boundaries introduced unwelcome uncertainty and potential for future political conflict. Such unilateralism was reinforced by the total lack of any national spatial policy, let alone a national interpretation of polycentric urban development, and a complete absence of specific spatial representations in the then regional planning guidance, RPG12.

The urban centres
It was also significant that various mappings used in the study highlighted the four urban centres and the four local authority areas in different manners. The original brief visually conceived polycentricity at the micro-level of South Yorkshire as involving collaboration and interdependency between the urban cores of Sheffield, Rotherham, Barnsley and Doncaster (see Figure 2). These were also consistent 'baseline' representations in the 'five propositions'. Clearly these centres represented considerable fixed and 'sunk' investment, but their spatial representation in this way also reflected immediate and contested roles as sites for major investment within

the EU Objective 1 programme, an equitable prioritisation of resources that had been contested with EU DGXVI, as it ws then. However, the potential link between these centres and their political and administrative bases in the four local authorities, was down played, even to the point of exclusion by the individual boundaries of the districts/municipalities not being shown on the 'five perspectives', although analysis was undertaken at this scale within the assessment stage.

At the heart of these spatial interpretations was the contested meaning that was to be placed on the respective economic roles of the four centres, and the role of a possible fifth centre in the Dearne Valley, and the supposed inter-relationships and collaboration between these urban centres, normatively required from polycentric development. At the time of the Study, an agreement was in existence between the local authorities of Sheffield and Rotherham that they should seek economic collaboration. Simply, Rotherham had available land unlike Sheffield, and Sheffield had the spatially fixed assets perceived necessary for the development of the 'knowledge economy' - universities etc. However, the aspirations of Doncaster to become a 'regional city' and for Barnsley town centre to become a 'market town of the 21st century' were spatial development concepts openly contested, and contestable. However, a consensus was constructed around these meanings, partly because national government policy was encouraging and actively supporting an 'urban renaissance' policy, but further potential conflict was illustrated in the alternative perspectives taken on the level of growth to be accommodated in the Dearne Valley, and the extent to which the Strategic Economic Zones should be spatially restricted (significantly re-titled in the consultant's report as urban economic zones).

The urban-rural

The attention given to debates and representations of the main urban centres was to highlight greater uncertainty about areas outside these core areas. These areas had no distinct or powerful political voice as such, except in the Dearne where the ex-coalfields had representation through various multi-agency partnerships, supported by waning political power within Barnsley, and to a lesser extent, Rotherham councils. A key issue in these considerations, and one that grew in significance as the 'five propositions' were given increasing clarity, was that of connectivity, linked to debates about environmental sustainability and the dysfunctional actions taking place with respect to transport investment and services. At the heart of these debates was the lack of clear and shared spatial visions of what future role that small towns and villages might play in spatial development, other than to be sources of commuting and gentrification. These 'dormitory' settlements were increasingly dependent on the main urban centres, access to other urban centres outside South Yorkshire and the virtual worlds of on-line shopping, home-based entertainment etc. The terms 'market town' or 'rural service centre' were consistently put forward, often as a 'gloss' on the attempts to attract 'young middle class' populations, without evidence of the economic, environmental and social viability of such constructs being examined.

Rural, at least as a non-urban core construct, primarily came to the fore during the assessment of the 'five propositions' and in the design of spatial tools seen as necessary to deliver any future spatial strategy for South Yorkshire. As well as connectivity, housing was a central issue to these constructs, largely as a result of the inherited settlement pattern of the old coalfields. Very often in debates and discussions, proponents for growth outside the main urban centres referred to the need to

protect and support these 'existing communities'. The distinctiveness of these rural localities was less obvious as the physical, visible, cultural and political identities were being removed through regeneration programmes, and 'out of town' retail/ leisure developments and private housing estates became more prevalent, connected primarily by investment in road network improvements. For the urban cores of Rotherham Barnsley and Doncaster with declining populations, increasing levels of social exclusion and housing market de-investment, such pockets of 'surburbia' offered an extremely contestable notion of balanced development. A contestation that was given expression in proposals for the extent and boundaries of the green belt to be reviewed, a highly sensitive issue for politicians and planners alike.

Connectivity

The industrial history of South Yorkshire greatly influenced the spatial development of transport investments and behaviours, both of which became severely challenged by the almost total collapse of the steel and coal industries. South Yorkshire was not an urban conurbation, served as West Yorkshire is, by commuter networks of rail and bus services. Internal links were limited, as were the previous mobility ambitions of working class communities, and international connectivity limited or oriented to moving bulk products. The re-positioning of South Yorkshire, and its constituent urban settlements within a global and hyper-mobility context required fresh spatial constructs and innovative solutions. However, investment in infrastructure and services was cast within a privatised, de-regulated and largely road based mind-set. Desires by members of the South Yorkshire Forum to reduce the friction of low accessibility through vastly improved public transport, especially within the ex-coalfields, were not matched by national policies and expenditure, which fundamentally shaped and conditioned local behaviours.

A further striking spatial influence on the conceptualisation of development within the sub-region, and on the meaning of South Yorkshire internationally was the proposal to re-use a former military airfield at Finningley, near to Doncaster, as a new passenger airport. The sub-region had long voiced concerns at not having such a facility, despite the relative close proximity of Manchester, East Midlands, Leeds/Bradford and Humberside airports. Not surprisingly the potential of this facility played a part in Doncaster's claim for 'regional city' status, but the mixed identities and meanings to this development became reflected in its chosen name Robin Hood Airport Doncaster-Sheffield. Flights, mainly to holiday destinations and tourist cities began in 2005. Another accepted and shared discourse about mobility within the sub-region concerned the perceived poor connectivity between the urban cores, in particular Sheffield and Barnsley, with other major cities, primarily London, Leeds and Manchester. Here, there appeared to be growing recognition that a 'post-industrial' sub-region required the same ambition for frictionless mobility associated with these larger metropolitan economic growth areas. Here, the notion of much of South Yorkshire being in the hinterland of both Leeds and Sheffield was posited, but never fully represented in the visual mapping of the sub-region. From another perspective, the desire for greater connectivity represented a desire to 'borrow scale', revealing perhaps the perceived weakness in the indigenous assets and capacity of the sub-region to compete equally in the 'new global, knowledge-based economy'.

As in other contexts, what we see in South Yorkshire is how the action of deliberating on space - of generating new spatial diagrams of a polycentric subregion – served to create a lightning rod for a re-territorialised politics.

ESPON's 'pure' polycentricity

It has been argued, and is clearly stated in the ESDP, that EU spatial policy cannot exist without 'a solid patrimony of analyses and interpretation referred to the whole of the European territory' (CSD, 1999). ESPON, then, is in the business of creating a new domain of spatial knowledge, at the same time legitimising the principle of intervention at this scale, and showing that particular policy interventions are effective in terms of EU objectives: 'No longer conceived as part of the ESDP process, it has become an effort in its own right'. (DG Regio, 2004). A focus of ESPON's work has been to design a common approach to spatial analysis which will allow European spatial questions to be addressed, based on an understanding of a single territory composed of functions, networks and relations. Rather than national boundaries, new functional areas become prominent. An important aspect of this work has been to develop common indicators which will help in conducting spatial analysis which will be relevant to the pursuit of common spatial objectives, including for example accessibility, population density. It becomes important then to look more closely at the way that these particular ideas of urban functionality and accessibility become operationalised within new frameworks of spatial analysis.

The rapidly spreading policy idea of polycentricity articulates a European space of networked cities embodying the idea of balanced development, reliant on a trans-European transport network. The persuasiveness of such policy ideas comes to hinge on thin simplifications which make possible an analytical legitimation of polycentric urban development, or of networked mobility, across European space. Thin simplifications are inescapably part of the spatial analysis which may generate legitimising outputs the persuasive, smoothing 'facts' of a new European spatiality. By probing at the calculative practices which are used to demonstrate the potential 'effectiveness' of these policy ideas, this paper opens up these apparently persuasive discursive constructs. It is shown how the persuasive power of the calculations relies on particular thin simplifications of European space which foreground certain mobilities and spatialities while marginalizing others.

ESPON analysis

ESPON's research on polycentricity (eg Project 1.1.1) takes a different point of departure and is top down in nature:

> "Previous research on this general topic has focused predominantly on the intra-urban scale and on the organisation of cities at the local level. For the ESDP, as well as for this ESPON project however, the point of departure is that of the European scale, as little research has as yet been done in respect of the European level (macro) or the inter-regional level (meso) in this regard. As such, this project, as with the other projects in the ESPON programme, is rather unique, both because it has a top-down perspective and because it covers all 29 countries of the ESPON space." (ESPON 2005: 4)

The research concludes that the ESDP's ideal aim of pursuing polycentricity at micro, meso and macro scale is not upheld by evidence. The findings suggest there is tension and little convergence between the meso and macro scale pursuit of polycentricity, and regional action:

> "While polycentricity within urban regions may still be a more favourable option from an urban planning perspective, its relevance for European and

national spatial planning remains to be established." (ESPON 2005: 240; figure 3 in this paper)

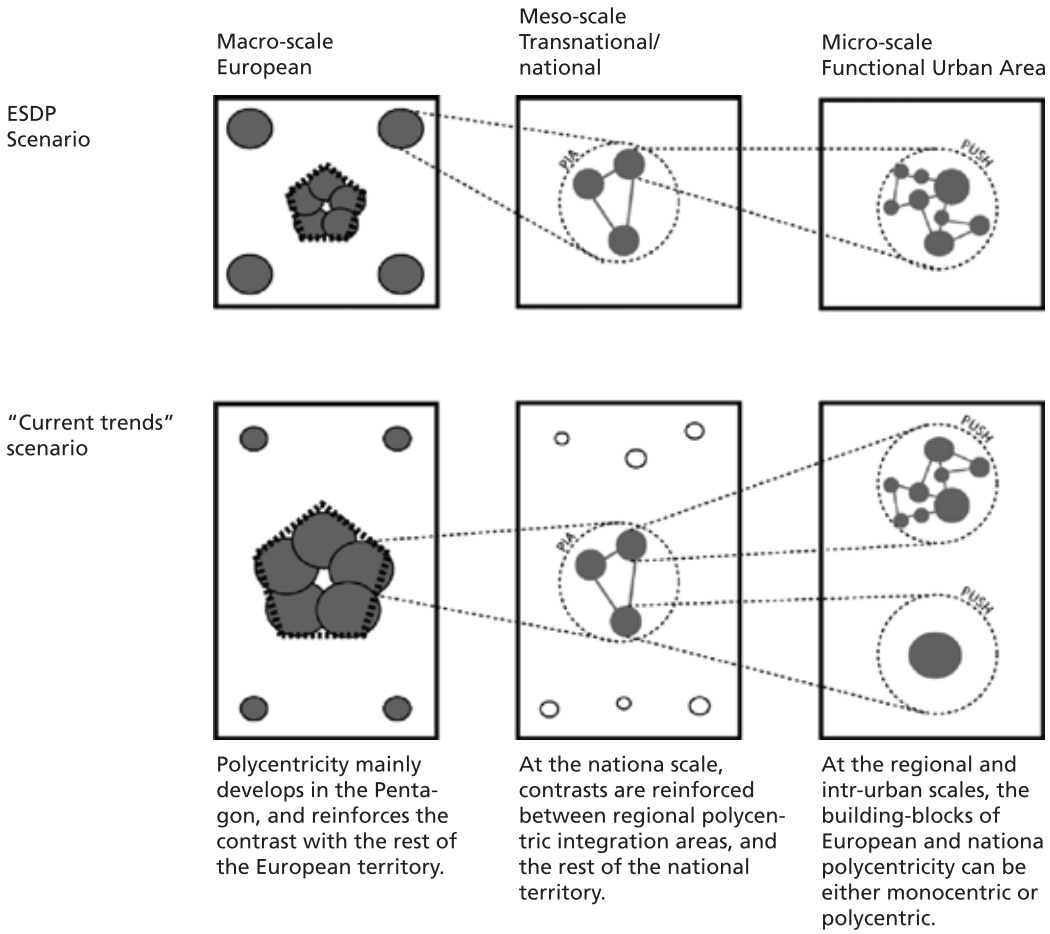
So how is South Yorkshire seen from ESPON's macro-analytical perspective? In fact, this type of territory is not visible in the analytical mapping, and the agglomeration of Functional Urban Areas (FUAs) does not pay regard to ad hoc territorial boundaries as defined more locally. Sheffield, however, is more visible, and some layers of analysis, which create aggregations of FUAs, identify 'Sheffield' as the 11th most significant *Main Potential Polycentric Integration Area* (PIA) in Europe (ESPON 2005, Table 5.6, Figure 4 in this paper, available in the annex for colour maps), with a combined population of approx 9.5 million. However this has little or nothing to do with the subregional pursuit of polycentricity as a policy objective, it being simply derived from an aggregation of overlapping travel to work areas. 'Sheffield' from ESPON's perspective is an amalgam of urban centres which appear to include the city of Leeds, to which it is usually regarded as subordinate in national and regional territorial politics. The construction of 'Sheffield' in this way does not relate well to the actual territorial politics of the north of England, and neither does it reflect the existing functional relations between urban centres. Something appears to be lost in this 'thin simplification' of space which relies so heavily on measurable population size rather than a detailed analysis of functional relations.

The ESPON research points to the conflict between the pursuit of polycentricity at the European level through such policies and the ESDP's goal of achieving a balanced polycentric urban system, concluding that: "It will be the task of further research to point towards rational trade-offs in this goal conflict." (ESPON 2004: 16)

Conclusion: a gap between top down and bottom up perspectives

In this paper we have set out a situated analysis of the territorial impacts of a spatial policy. This was done by showing how policy ideas from the ESDP were translated at critical moments: in the brief to consultants, in the subsequent debate, and in the framing of the territorial structures.

It becomes clear that whilst ESPON's research seeks to analytically determine the meaning and significance of polycentricity, now more than 6 years beyond the ESDP, the idea of polycentricity has taken other paths into territorial politics and strategy making where its translation remains open and contestable. This brief analysis reveals a clear gap between this micro-political and ESPON's macro-analytical views of polycentric urban development, which hinges partly on the scales of application of the policy idea, and partly on the different meanings that result from situated territorial engagement. The possibility of pursuing questions of spatial justice appears to be opened up more clearly through situated analysis, but there seems to be a promising line of inquiry here which could benefit from combining these different research approaches.



Source: ESPON 2005, figure 9.1.
Figure 3: Challenges in the implementation of polycentricity at all spatial scales

From the perspective of ESPON's macro-analysis of polycentricity, it could be concluded that the future development of the functional relations between South Yorkshire's urban centres is irrelevant to the opportunity for 'Sheffield' to become a high ranking polycentric territory. From the perspective of the micro-analysis of polycentricity contained in the South Yorkshire Spatial Study, it could be concluded that such external agendas are not relevant to the functional relations between neighbouring cities and urban areas which are the focus of attention. But the more detailed analysis of the South Yorkshire context suggests that this is more than an issue of scale and functionality. It is a question of politics and governance. The translation and framing of polycentricity in South Yorkshire clearly responds to the critical challenges of current territorial politics at the subregional scale at which they resonate most strongly, and where key drivers for policy attention exist. There is a serious lack of fit between the 'Sheffield' of ESPON's PIA mapping, and the 'Sheffield' of a polycentric South Yorkshire. One construction is purely analytical whilst the other is more contingent. Contingent policy constructions also locate Sheffield at other scales – peripherally and subordinate to Leeds within both the Regional Spatial Strategy and the Northern Way.

The Study Brief: Transfer of a European idea
"To achieve the South Yorkshire Vision, it will be critical to clarify options for the sub-region's future economic role within the family of northern and midlands city-regions, and within the wider economy of the UK as a whole… At a local level, a South Yorkshire polycentric zone would link the four urban centres and the surrounding cities and towns outside the sub-region. The urban centres would be the focal point for smaller towns, villages and rural areas to access jobs, training, leisure and other facilities. Each centre would play its part in a spatially define interdependent economic framework" (cf. Figure 2).
The Consultant's Study: Translation through communicative processes
"Polycentric development is taken in this study to be the strategic co-operation between a ***network of specialised urban economies***. Such economies can all take advantage of the global knowledge economy in so far as they can find ***complementary and inter-dependent functions.*** Cooperation occurs between individual urban areas on the basis of shared desires and ambition, which in turn leads to ***cooperation that achieves mutual benefits.*** As well as providing a spatial economic development model, polycentric urban development is underpinned by a common political strength arising out of the mutuality and inter-dependence between the urban areas."
The Five Spatial Propositions: Policy Meanings through mapping
South Yorkshire Now; Monocentric; Bi-polar; Polycentric; Polycentric Plus; Dearne-Don Axis (cf. Figure 4 available in the annex for colour maps).
The Assessment Criteria: Meaning through policy fit
Spatial objectives: image reputation; cluster development; enhancement of 'competitiveness factors'; urban centre and rural distinctiveness; sustainable pattern of settlement; housing market renewal; improved connectivity; capability of delivery. ***Economic outcomes:*** adjustment and growth. ***Policy changes:*** settlement pattern / function; spatial distribution of growth; green belt boundaries; targets for new housing on brown/greenfields; SEZ spatial coverage; future transport investments.
The Tools and instruments: Meaning through classification and hierarchy
Urban economic zones; Main urban centres; Urban service centres (complementary local service role to main urban centres); Urban renewal areas (primarily housing areas, lacking distinctive service offer); Renaissance market towns (larger free-standing towns with rural catchment areas); Rural service centres (small, free-standing settlements with localised catchment); Rural renewal areas (rural housing areas requiring environmental enhancement, possible contraction); Special development areas (Finningley airport; proposed environmental development zone).
The 'Client's' Decision; Meaning through governance.
The Leaders agreed that a South Yorkshire Now spatial proposition was not an option and any future work carried out should focus on the Bi-polar and Polycentric spatial proposals. It was believed that more can be achieved by working together through a spatial strategy; that it was critical to differentiate the role of the four urban centres, and their development and growth would be the primary focus of the strategy; and that Sheffield and Rotherham are economically and physically interlinked - but must continue to have distinctive identities; BUT the enhanced role of Doncaster as a 'regional city' required further testing; and there was a need to re-examine the future of the Dearne Valley.

Figure 5: Stages in the preparation of the South Yorkshire Spatial Study and expressions of 'spatiality'

So rather than resolve this question as a simple matter of scale difference, it becomes an issue of how spatial analysis (whether at micro, meso or macro scales) connects with territorial politics at those scales. This seems to be an important area for further research: understanding how spatial ideas relate to the multi-scalar contexts within which they are translated and implemented. Meta-analysis may be capable of helping to bridge the gap that exists between the pure analytical perspective provided by ESPON's research, and the contingent construction of polycentric spaces which is taking place across EU territories.

Overall, we conclude that ESPON's research faces a challenge that it shares with other attempts at macro-level spatial analysis. To achieve any sort of understanding of complex spatial development trends and interventions requires making simplifications -we have illlustrated this here by focusing on the simplification of European space in ESPON's work on polycentricity. Our analysis points to a clear risk of creating analytical outputs which fail to resonate with situated territorial politics – that they may face difficulties in crossing the bridge between macro-analytical purity and situated micro-politics. This is in part because ESPON's research does not analyse the factors that are most meaningful to the local actors who are using spatial policy ideas like polycentricity to rethink complex inter-urban relations. The tension between population centred analysis, and analysis which might seek to understand spatial relations in a more complex way which could give meaning to complementary urban functions, illustrates this problem. Why produce images of a networked European space, powerfully suggestive of possible new urban configurations, if these are based on analysis which agglomerates citizens based on journeys from home to work, but which does not engage deeply with the actual or potential relations between places? We suggest that acts of simplification should be accompanied by awareness and reflection on the consequent dangers. Otherwise, simplifying polycentricity in a mode that meets the demands of macro-analytic feasibility may lead to unpersuasive results, and research which is regarded as less relevant to practice. One way to address this concern would be through a rigorously designed programme of comparative case study research which explicitly engages with the dimensions of polycentricity that are regarded as significant by local actors in different contexts.

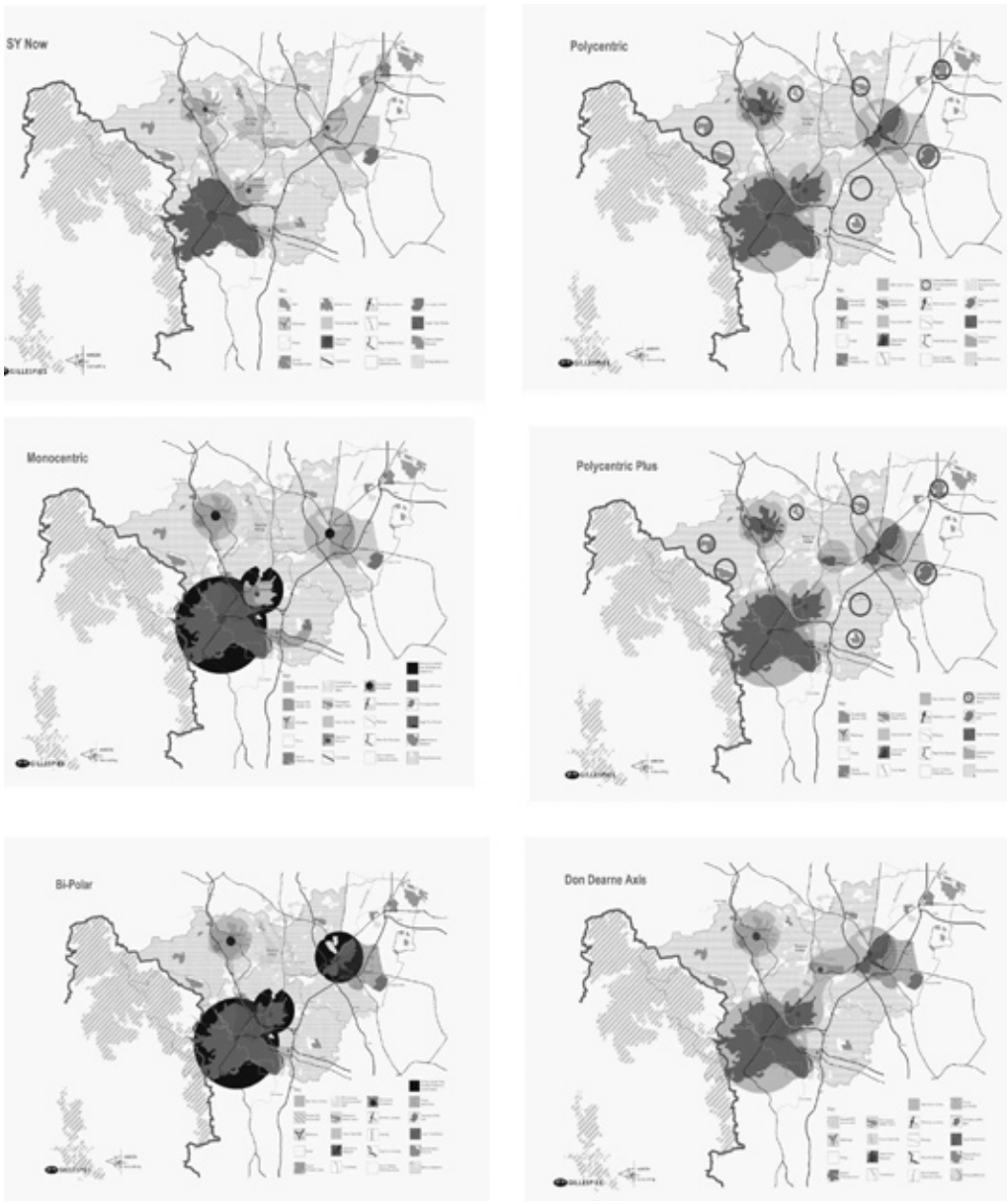


Figure 6: Mapping of the Spatial Propositions in the SYSS

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SPATIAL ANALYSIS TOOLS AND INSTRUMENTS

by Volker Schmidt-Seiwert

Volker Schmidt-Seiwert holds a diploma in applied geography and works as project coordinator in the field of European spatial and urban development in the Bundesamt für Bauwesen and Raumordnung (BBR - Federal Office of Building and Regional Planning). His activities are mainly related to the continuous spatial monitoring system of Europe of the BBR and covers GIS based and statistical regional analysis of European spatial structures and developments. One special interest in this context is the regional competitiveness and regional development. He is also engaged in the cartographic representations and visualisation concepts of spatial phenomena.

Volker Schmidt-Seiwert proposes an approach to analyse the specificities and opportunities of the ESPON territories. He explains the approach developed by ESPON 2.4.2 project, which is based on the so-called Regional Classification of Europe (RCE) and on new combinations of results from ESPON finalised projects. In particular, this paper is focused on the Lisbon situation and aims to explain the methods used in the process of information aggregation which lead to the final analysis and the carto-graphic representation of the results. It analyses the regional economic patterns in relation to economic convergence and to regional competitiveness and employment, allowing to identify territorial specificities and potentials within the ESPON space.

A regional situation analysis

The ESPON projects focus on a broad range of spatially relevant trends and policies and analyse the regional patterns and impacts of these trends and policies. In the course of the programme a wide variety of project results indicate thematically orientated spatial structures and developments and sectoral policy-determined impacts on the European territory.

The ESPON project 2.4.2 "Integrated analysis of transnational and national territories" was asked to "zoom" in on different territorial contexts and scales, in order to identify existing spatial patterns and territorial specificities and complementarities. This exercise took into account the themes covered so far by the ESPON programme and the related most relevant indicators (core indicators).

The elaboration of spatial patterns within the regional situation analysis of Europe was done combining different indicators (bi- or multivariate analysis), using synoptic combinations of existing ESPON results (typologies, classifications) and new and further interpretations and combinations of ESPON indicators in form of synoptic analysis of regional structures and trends.

One of the approaches carried out within this project and thought to cover the European level and its multilevel dimension of the spatial patterns. This was done through a thematic oriented analysis approach, which will be explained later on in this paper. The project has also focused both on the transnational and the national level, considering different scientific methods.

The regional situation analysis of Europe joined the different elements of the regional investigations of the ESPON project 2.4.2, as well as the topic-results of other ESPON projects to assess the European main territorial structures. Basically two different components have been used to approach the thematic overlay and the combination of ESPON-based information and indicators:

- Results of the regional classification of Europe (RCE), mainly using a combination of different themes or selected indicators with a regression analysis

- ESPON results of selected projects by using their original presentation and also adding a new interpretation on the basis of the data delivered to the ESPON database.

In total six synoptic analyses have been elaborated within the project to describe the main territorial aspects covered by ESPON projects: spatial situation, Lisbon situation, labour situation, accessibility situation, natural situation and Global Integration Zones.

This paper is focused on the Lisbon situation and aims to explain the methods used in the process of information aggregation which lead to the final analysis and the cartographic representation of the results. In particular, it is centred on economic aspects in relation to economic convergence and to regional competitiveness and employment that allow to analyse disparities, weaknesses and potentials in relation to expected economic challenges and strategies.

Regional classification of Europe – starting point of the situation analysis

The most basic and transparent way to describe spatial patterns and regional situations can be done by just using one single indicator and its regional distribution as the key descriptor. Despite its simplicity this method is of extremely high importance when it comes to policy application and formulation. The most prominent example of this approach is the delimitation of areas eligible for Structural Funds Objective 1. As well known, one indicator *(Gross Domestic Product)*, and one threshold value (75% below the EU average) are the criteria to define "lagging regions" in this specific policy field.

A more sophisticated variant would be the (bi- or multivariate) combination of different indicators using diverse normalisation procedures from the national average up to purely statistical standardisation means. This method is comparable to the procedure of delineating the regions eligible in Objective 2. Related to a synoptic analysis of existing ESPON results (typologies, classifications), new and further combinations of ESPON indicators, especially of core indicators could be envisaged in this respect.

With the use of an additive grouping of indicators the analysis approach gains in complexity. Different methods can be used in the processes of thematic overlay and aggregate indicators. One approach applied in the Regional Classification of Europe (RCE) and is described further on, is to additively link indicators (which may be classified by pre-defined threshold values) to complex indexes of regional situations. In this process, the degree of transparency decreases as additional information to understand or reconstruct regional situations is needed.

The next level of complexity builds on a multivariate statistical analysis based on linear models. These models analyse the relations between indicators (e.g. by correlation and regression analysis) and consolidate the statistical information for example through a factor and cluster analysis.

Beyond statistical analysis, also a GIS-based combination of ESPON results has been considered for the analytical support. In fact the RCE is a multi-dimensional setting which disaggregates different aspects and components of relevant spatial structures and developments taking into consideration the current policy aims and goals in the field of the discussions in territorial policy. By this, the following thematic fields

of the RCE were elaborated in a first step: economy, labour market, Lisbon performance, demography, naturalness, natural hazards, technological hazards and accessibility.

It is obvious that the single themes were considered separately due to analytical purposes and to enable a detailed view, being aware, however, of existing thematic coherences. The differentiation between causes and effects was also taken into account in the separation of the thematic fields regarding e.g. economic output and development as effects of a regional structure determined by the labour market or the settings related to the Lisbon performance on the cause side of the regional performance.

Labour market is the thematic field representing the basic conditions of the regional economy, the field of Lisbon performance represents the competitiveness-related component within the list of causes. Demographic structure and development mainly describes general regional disparities arising as a consequence of the labour market conditions representing push and pull factors related to job opportunities.

The indicator set for the Regional Classification of Europe

The ESPON data base (to which each ESPON project contributes) and the list of ESPON core indicators, i.e. the indicators rated as the most important by the projects, enabled to create a base providing the basic set of indicators for the classification of the European regions.

The eight thematic fields of spatial development could be characterised through a total of 30 indicators, taking into consideration data availability. The decision of using indicators from finalised ESPON projects limited the topics of analysis and did not allow the introduction of social and environment information that could be useful to cover the full range of territorial assets.

Following the first Regional Classification Analysis of Europe developed by ESPON project 3.1, the choice and respective grouping of indicators were modified and updated by ESPON project 2.4.2, taking into account a discussion process within the ESPON and the main policy developments in this field (table 1).

In order to make the 30 indicators comparable, each of them was transformed via z-transformation. All z-transformed distributions have two features in common: the mean is exactly 0 and the standard deviation is 1. Thus, a region showing a value of 0 in a z-transformed variable has, related to the original indicator, a value which equals the arithmetic mean of this indicator over all European regions. A region with a z-value of -1 is 1 standard deviation below the European average.

In a second step, the (z-transformed) indicators have been polarised. In this process it was assumed that both negative (e.g. GDP, population) and positive (e.g. unemployment rate, risk of natural hazards) deviations from the average could represent a "problematic" situation. Therefore, after polarisation, all positive values show positive situations and all negative values mean negative situations.

In a third step, the z-transformed and polarised indicators have been transformed into classes. The aim was to identify thresholds for these classes on the basis of experts' knowledge, political agreement and/or scientific project results. For instance, in structural funds lagging regions are usually defined as having a GDP/

capita value below 75% of EU average. Therefore, the main question was to find out whether it would be possible, through a dialogue between scientists and policy makers, to set and apply, in a similar way, thresholds (or classified values). E.g. depopulating regions, economically stagnating regions, regions under specific natural risks or hazards.

Thematic fields and indicators of final RCE

Theme and indicators	Description	Polarity
Economy		
GDP	GDP per capita in PPS 2002	+
GDP growth	Growth in GDP per capita in PPS 1995 - 2002 in percent	+
Lisbon performance		
Productivity	GDP per person employed in EURO 2002	+
Employment rate	Employed population / population aged 15-64 2003	+
Expenditure on R&D	Expenditure on R&D / Total GDP 2001	+
R&D Business Enterprise Sector	BES R&D personnel per 1.000 active person 2001	+
High educated population	Highly educated population / total educated pop. 2002	+
Labour market		
Unemployment	Unemployment rate 2003	-
Development of unemployment	Change of unemployment rate 1999-2003 in percentage points	-
Youth unemployment -	Unemployed < 25 years per 1.000 inh. 15-<25 years 2003	-
Labour force replacement ratio	Population ages 10-19 / population ages 55-64	+
Employment density	Number of persons employed per km² 2003	+
Employment in tertiary sector	Share of total employment 2003	+
Demography		
Ageing	Share of population in the ages over 65 in percent	-
Reproduction potential	20-29 years in 2020 per 20-29 years in 2000	+
Population growth	Change 1995-2002 in %	+
Naturalness		
Artificial surface	Share of total area (Corine)	-
Natural surface	Share of total area (Corine)	+
Agriculture intensity	Output/input ratio	-
Natural hazards		
Flood events	Regional average number of flood events 1987 - 2002	-
Winter storms	Approximate probability of having winter storms	-
Earthquakes	Earthquake hazard potential	-
Dry spell & drought	Change of dry spell combination with drought	-
Forest fires	Forest fires hazards 1997-2003 in biographic correlation	-
Technological hazards		
Oil hazards	Oil hazards	-
Chemical plants	Density of chemical plants	-
Accessibility		
Potential accessibility	By road	+
Potential accessibility	By rail	+
Potential accessibility	By air	+
Time to market meso-scale	Accessibility by rail and road, weighted by pop.	-

Source: Draft Final Report ESPON project 2.4.2
Table 1: Thematic fields and indicators of the RCE

In fact, the results of first attempt on this direction, that involved Transnational Project Groups (TPGs) from other ESPON projects, showed that this idea of establishing new thresholds was not (or not yet) possible. Therefore, as a substitute for this method, a purely formal, statistical procedure to define thresholds for positive and negative regional situations was chosen. According to this approach, regions showing values below -½ standard deviation were classified as indicating some "problem" in the field considered, regions showing values above +½ standard deviation were regarded as showing a good performance or situation in comparison to other European regions.

Finally, in the procedure of mapping RCE the classification of the values and in particular the legend range has been calculated on the basis of the mean value and the standard deviation. In practical terms, below average means from minimum up to mean value - 1,16 standard deviation; moderately below average: from mean value - 1,16 standard deviation up to mean value - ½ standard deviation; average: mean value ± ½ standard deviation; moderately above average: from mean value + ½ standard deviation to mean value + 1,16 standard deviation; and above average: from mean value + 1,16 standard deviation to Maximum (figure 1).

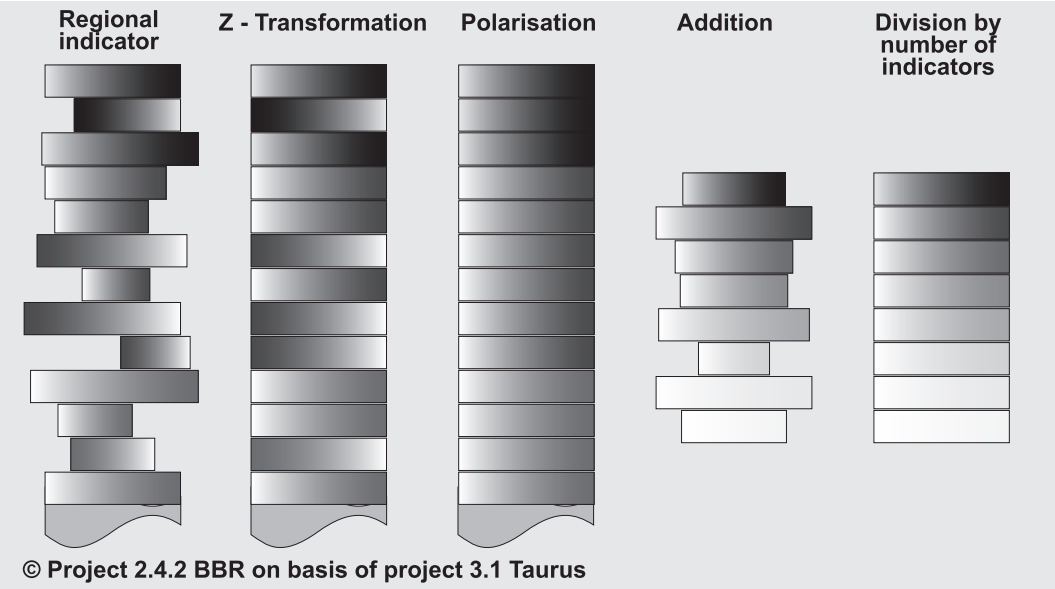

Figure 1: Towards standardised sum indicators in RCE

Selected final thematic results from the Regional Classification of Europe (RCE)

Economy

The combined RCE indicator in the field of economy (cf. Figure 2 available in the annex of colour maps), representing both, economic strength measured in GDP in purchasing parities (2002) and the development of the GDP (1995-2002) draws in economic terms a bond between the old and the new member states of the Union.

The view on the national scores identifies Ireland as the member state with the highest national average, followed by Finland, the Slovak Republic and the United Kingdom. Regarding the latter, Inner London comprehends the highest regional value of the ESPON space.

In this combination the well known picture of the "rich" West and the rather "poor" East is dissolved in respect of the existing economic strength and the potential growth, that is in general terms concentrate on the main economic centres of Europe.

The capital regions are the economic strong points in the old Member states and the centres of development in the new member states. Highest GDP per capita values are found in the centres as London, Brussels, Luxembourg, Hamburg, Oslo, Paris (Île de France) Wien, Zürich and Frankfurt.

These regions do not only have the highest GDP per capita values in Europe, but they are also among those regions in the old EU with the highest values of GDP growth.

Besides these, regions like Darmstadt (Frankfurt) and Oberbayern (München), the two Irish regions, the Midlands and South East in England, Voreio Aigaio in Greece belong to the best performing in the old EU.

In Poland the regions Opolskie and Slaskie and in the Czech Republic Stredni Morava and Moravskoslezsko, all of them old industrialised regions, or Dél-Alföld in Hungary do not participate in the general economic growth tendency of these countries. Romania and Bulgaria stay outside of the general process of starting integration of the new member states.

In general, the regions below average could be considered as the most lagging behind regions of the Union in economic terms and having the greatest need of support for restructuring and strengthening of the endogenous potential of the region. In an all Union delineation, considering and recognising the different levels of development and welfare, these regions rank in the up most position for structural funds eligibility.

The national view clarifies for the Eastern European countries that the capital regions are also the main driving regions in the Baltic States. In general the national differences between the regions are getting more distinct. The concentration of above average regions in the main economic centres underlines their importance in the national context as driving forces not only in the new Member States but also in the Rhein-Main area (region of Darmstadt), Stuttgart and Oberbayern (in Germany) or the regions of Roma, Milano and Liguria (in Italy).
Regions situated on the average level in European context, like Lorraine, Trier, Wales, Sør-Østlanded, Itä Suomi or Niederösterreich have clearly below average values compared to the corresponding national averages.

	Z-Add-Econ	
1	Inner London	3,65
2	Luxemburg (Grand-Duché)	2,51
3	Southern and Eastern (IE)	2,49
4	Berkshire, Bucks and Oxfordshire	1,78
5	Région de Bruxelles - Capitale / Brussels Hoofdstedelijk Gewest	1,71
6	Praha	1,70
7	Közép-Magyarország	1,67
8	Bratislavský	1,64
9	Åland	1,51
10	Oslo Og Akershus	1,49
11	Mazowieckie	1,37
12	VoreioAigaio	1,36
13	Região Autónoma da Madeira(PT)	1,32
14	Gloucestershire, Wiltshire and North Somerset	1,20
15	Utrecht	1,18
16	Surrey, East and West Sussex	1,14
17	Île de France	1,05
18	Bedfordshire, Hertfordshire	1,03
19	Stockholm	1,02
20	Etelä-Suomi	1,01
...	...	
274	Ciudad Autónoma de Melilla (ES)	-1,25
275	Nord-Vest (RO)	-1,31
276	Yugoiztochen	-1,44
277	Severozápad	-1,45
278	Severoiztochen	-1,47
279	Sud (RO)	-1,57
280	Nord-Est (RO)	-1,78
281	Sud-Vest (RO)	-1,79
282	Yuzhentsentralen	-1,84
283	Sud-Est (RO)	-1,90

	z-value GDP in PPS per 2002	
1	Inner London	5,94
2	Région de Bruxelles -Capitale / Brussels Hoofdstedelijk Gewest	3,78
3	Luxemburg (Grand-Duché)	3,19
4	Hamburg	2,52
5	Oslo Og Akershus	2,41
6	Île de France	2,21
7	Wien	2,12
8	Zürich	1,89
9	Berkshire, Bucks and Oxfordshire	1,83
10	Provincia Autonoma Bolzano - Bozen	1,77
11	Stockholm	1,73
12	Oberbayern	1,73
13	Åland	1,64
14	Utrecht	1,63
15	Darmstadt	1,60
16	Praha	1,59
17	North Eastern Scotland	1,52
18	Bremen	1,50
19	Southern and Eastern (IE)	1,44
20	Suisse du Nord-Est	1,42
...	...	
274	Nord-Vest (RO)	-1,78
275	Severozapaden	-1,83
276	Severentsentralen	-1,84
277	Sud-Est (RO)	-1,85
278	Severoiztochen	-1,86
279	Yugoiztochen	-1,87
280	Yuzhentsentralen	-1,89
281	Sud-Vest (RO)	-1,89
282	Sud (RO)	-1,89
283	Nord-Est (RO)	-1,96

	z-value GDP growth in PPS per capita 95-02	
1	Southern and Eastern (IE)	3,54
2	Mazowieckie	3,39
3	Közép-Magyarország	3,28
4	Voreio Aigaio	3,09
5	Estland	2,99
6	Lettland	2,93
7	Região Autónoma da Madeira (PT)	2,74
8	Bratislavský	2,58
9	Litauen	2,33
10	Border, Midlands and Western (IE)	2,03
11	Peloponnisos	1,83
12	Nyugat-Dunántúl	1,83
13	Luxemburg (Grand-Duché)	1,82
14	Praha	1,81
15	Ipeiros	1,75
16	Wielkopolskie	1,73
17	Berkshire, Bucks and Oxfordshire	1,73
18	Bucuresti	1,66
19	Notio Aigaio	1,60
20	Stredné Slovensko	1,55
...	...	
274	Nord-Est (RO)	-1,60
275	Hannover	-1,64
276	Sud-Vest (RO)	-1,70
277	Ticino	-1,77
278	Yuzhentsentralen	-1,79
279	Severozápad	-1,83
280	Berlin	-1,93
281	Sud-Est (RO)	-1,95
282	Ciudad Autónomade Ceuta (ES)	-2,07
283	Ciudad Autónoma de Melilla (ES)	-2,20

Figure 3: Ranking of RCE economic indicators

Lisbon Performance
The Lisbon performance indicator (cf. Figure 4 available in the annex of colour maps) combines productivity (GDP per person employed), labour participation, R&D expenditures, personnel in private sector R&D and the educational level of the population.

The regional presentation of this indicator shows a distinct West East gap and a North South divide. Switzerland, Denmark, Luxemburg, Norway, Finland and the United Kingdom are the leading countries with the highest Lisbon values in comparison to the 29 countries of the ESPON space. The highest regional values can be found in Stockholm and Hamburg. At the bottom end of the national Lisbon ranking are the new member states - the Slovak Republic, Hungary and Poland, and Bulgaria (acceding country).

The exceptions to this spatial frame are Estonia and Lithuania and the capital regions of these countries, that reach average values, including Attiki.

Considering the European context, five main zones with performances above average values can be identified. There are two zones in the North, the more isolated Finish region and the more integrated zone consisting of Denmark, Norway and Sweden and reaching from Stockholm and Oslo via the Belt and Gothenburg area to Denmark. The third and forth are the British zone mostly consisting of the South East and the Midlands and the Central Netherlands, North Belgium and West German zone, in Germany however only supplemented from the Aachen region. The fifth and largest zone stretches from Oberbayern (Munich) and South Germany via the Rhônes-Alpes down to Midi-Pyrénées (Toulouse) in France including Switzerland. "Lisbon islands" like Paris, Braunschweig and in some respect Ireland and Madrid complete this regional outline of competitive regions.

In its additive character this indicator combines in these 'Lisbon zones' high productive regions like London, Brussels, Luxembourg, Zürich and the Nordwestschweiz (Region Basel) with regions of high R&D importance like Braunschweig, Västsverige, Stuttgart; Oberbayern, Pohjois Suomi and regions with high employment rates like Berkshire, Bucks and Oxfordshire or Bedfordshire, Hertfordshire in the United Kingdom, the Alands, Vestlandet or Stockholm.

Moderately above the average are regions like the Midlands, Vlaanderen, the Western part of the Ruhr, Dresden and Madrid, among others.

The industrial regions with specific needs of restructuring like Northern part of the Ruhr area and comparable regions in Northern England score in European average. The comparison on basis of national averages highlights the different national 'Lisbon poles'.

In the United Kingdom the concentration in a belt around London shows quite clearly, also in the three main regions of France with high national values in this respect, the Île de France, Rhônes-Alpes and the Midi-Pyrénées. In France regions like Poitou-Charentes and almost all regions of the North East turn out with below average value in the Lisbon indicators. So do a large number of German regions in the North and the Northwest like Weser-Ems and Lüneburg, but also Kassel. Besides Dresden and Leipzig, all regions in the Eastern part comprehend below average values.

		z-Add-Lisbon Performance			z-Add-Lisbon Performance
1	Stockholm	2,07	259	Nord-Est	-1,08
2	Oberbayern	2,03	260	Centru	-1,09
3	Oslo Og Akershus	1,98	261	Dél-Alföld	-1,10
4	Stuttgart	1,87	262	Wielkopolskie	-1,11
5	Västsverige	1,80	263	Yuzhentsentralen	-1,11
6	Zürich	1,73	264	Észak-Alföld	-1,12
7	Île de France	1,60	265	Sud-Est	-1,12
8	Suisse Centrale	1,59	266	Podlaskie	-1,14
9	Région Lémanique	1,58	267	Dél-Dunántúl	-1,14
10	Suisse Du Nord-Est	1,54	268	Pomorskie	-1,14
11	Braunschweig	1,54	269	Podkarpackie	-1,15
12	Trøndelag	1,46	270	Yugoiztochen	-1,17
13	Espace Mittelland	1,45	271	Calabria	-1,19
14	Suisse Orientale	1,43	272	VýchodnéSlovensko	-1,20
15	Tübingen	1,41	273	Severoiztochen	-1,20
16	Régionde Bruxelles - Capitale / Brussels Hoofdstedelijk Gewest	1,39	274	Észak-Magyarország	-1,21
17	Inner London	1,39	275	Dolnoslaskie	-1,21
18	Berkshire, Bucks and Oxfordshire	1,39	276	Slaskie	-1,27
19	Bedfordshire, Hertfordshire	1,38	277	Kujawsko-Pomorskie	-1,28
20	Etelä-Suomi	1,32	278	Opolskie	-1,28
21	Darmstadt	1,30	279	Swietokrzyskie	-1,31
22	Pohjois-Suomi	1,25	280	Zachodniopomorskie	-1,32
23	Surrey, East and West Sussex	1,22	281	Severozapaden	-1,33
24	Hampshire and Isle of Wight	1,15	282	Warminsko-Mazurskie	-1,34
25	Noord-Brabant	1,11	283	Lubuskie	-1,36

Figure 5: Ranking of regions according Lisbon performance

Labour Market

Structure and development of unemployment, the regional potential concerning the replacement of the labour force and the sectoral orientation of the labour market are the ingredients of this sum indicator (cf. Figure 6 available in the annex for colour maps).

Obviously sufficient labour market conditions on national base can be found in Cyprus, Ireland, Malta, Norway and the United Kingdom, where the highest indicators values can be identified. Highest regional values can be found in Inner London, Ceuta y Mellila and the Île de France. Spain and the United Kingdom are countries with the greatest inner national disparities of the labour markets. The values of Galicia and the Highlands and Islands are nevertheless more oriented around the European average. The highest deficits in the regional labour market according the sum indicator value have Stredne Slovensko in the Slovak Republic and in a clear span below Dytiki Makedonia and Dolnoslaskie in Greece respective Poland.

The positive combination of these factors, especially low unemployment rates and employment in the tertiary sectors obviously determine the above average regional setting. The regions of higher response potentials and possibilities to react on structural changes are situated mainly in the Netherlands especially in the Randstad area, in the United Kingdom with almost all regions in the South but also in the Greater Manchester and Cheshire regions. The whole of Norway is characterised by a strong labour market, so is Ireland, but with the better situation in Southern and Eastern region with Dublin. The main European centres as well as parts of

Switzerland, Austria and northern and southern France belong in the group with above average scores.

The situation of the German labour market is difficult and appears just on an average level in European comparison. No German regions are in the group of highest above average values and the new Länder show in gradual transition to some of the new member states like Poland and Slovakia outside the capital regions of these countries, partly moderately and partly below the European threshold. Beside the level of unemployment the New German Länder have the lowest values related to the development of unemployment.

This kind of regions is determined by high unemployment rates and below average development of unemployment which means in fact increasing unemployment rates in the period considered. This applies also in the regions of Eastern Slovakia, Greece, Romania and Poland. In all Polish regions high unemployment and strong increase of unemployment determine the labour market, all regions are in European comparison below average, and even the capital region does not score better. In Poland the problem of the labour market is accompanied by the almost general minor importance of the employment in the tertiary sector.

The labour market's situation is better in the Czech Republic and in Hungary. The regional labour market potential reaches the EU 29 average in almost all regions.

		Z-Add- Labour
1	Inner London	2,12
2	Outer London	1,00
3	Régionde Bruxelles - Capitale / Brussels Hoofdstedelijk Gewest	0,88
4	Praha	0,86
5	Merseyside	0,68
6	Flevoland	0,68
7	Greater Manchester	0,67
8	Wien	0,67
9	Zuid-Holland	0,66
10	Utrecht	0,65
11	Noord-Holland	0,61
12	Oslo Og Akershus	0,58
13	Corse	0,57
14	Zeeland	0,55
15	Southern and Eastern	0,55
16	Cyprus	0,55
17	Região Autónomados Açores(PT)	0,54
18	ÎledeFrance	0,54
19	Comunidad de Madrid	0,50
20	West Midlands	0,50
21	Drenthe	0,47
22	Suisse Centrale	0,46
23	Hampshire and Isle of Wight	0,46
24	Border, Midlands and Western	0,44
25	Zürich	0,44

Figure 7: Ranking of regions according labour market

The Lisbon situation

The regional competitiveness very much depends on the interrelation of economic strength, the labour market orientation and the innovation potential of the regional economy. These factors determine regional capital and by this the response potential of a region towards the challenges of integrated markets.

In order to round off the spatial picture of the Lisbon situation different aspects of the ESPON results have been considered, in particular: the economic setting and Lisbon orientation, the dominance of selected functions of national/European and global significance of the ESPON FUAs and the below and above average value of the RCE labour market indicator.

The economic setting and the Lisbon orientation are based on a regression analysis of the RCE economy and Lisbon performance standardised sum indicators (cf. Figures 8 and 9 available in the annex for colour maps). The classes of the regional grouping on the basis of the deviations of the observed value of the independent (Lisbon performance) and the estimated value of dependent (economy) variables in relation to the regression line and the mean value of the standardised regional values. This can be seen in the scattergramm of the according regression analysis.

Some key figures describe regional groups that were elaborated in this way. The GDP per capita 2003 ranges from 13.720 PPS in the both economic and Lisbon orientated weak regions up to 28.331 PPS in the strong economic regions with high Lisbon orientation. The regions with economic growth potential have 16.723, and those with a less distinct economic trend 21.908 PPS per capita.

The unemployment rate of the regions with Lisbon deficits is 10,6% in the economic weaker regions and 11,2% in regions with growing potentials almost twice as high as in those regions with high Lisbon orientation and a strong economy with 5,7 % of the labour force or 7,0 % in regions with less distinct economic trends. Looking at the groups in the same order as above, the employment rate ranges from 58,0% over 59,0% to 69,6% and 67,8 %.

The obviously best situation under the Lisbon aspect can be found in the United Kingdom and Ireland, which both combine economic strength and a high Lisbon orientation. The regional labour market score in both countries is mostly above the average, only the Scottish regions show some deficits in this respect. The functional domination of the MEGAs is mostly single university oriented, only London has dominant functions in all selected fields.

In the other countries the number of this type of regions is rather limited. Due to the low economic growth in Germany none of the regions scores in this class. The Lisbon orientation at least in the south of the country, but also in some parts of the new Länder is promising.

In France a few regions like Île de France, the Pays de la Loire and Aquitaine have a good regional setting in this respect. The labour market situation in these regions however might hinder the potentials.

The Scandinavian countries are characterised by the concentration of economic strength in the capital regions. The other regions of these countries have in general

a high Lisbon orientation, but difficulties in the labour market in some regions of Sweden and Norway.

The eastern European countries, but also Greece and Portugal generally show deficits in the Lisbon orientation, accompanied in general by growing economic potentials. Only the Czech Republic, Bulgaria and Romania have weaker economic developments.

Deficits in the Lisbon orientation are accompanied by a mostly single functional orientation of a higher importance of the FUAs which is limited mainly to university, supplemented e.g. in the capital cities in the eastern EU and the candidate countries by administrative functions only.

	top 20 of group	top 20 of group	bottom 20 of group	bottom 20 of group
1	Stockholm	Bratislavský	Haute-Normandie	Sicilia
2	Oslo Og Akershus	Salzburg	Centre	Lubelskie
3	Île de France	Aragón	Prov.Namur	Severozápad
4	Régionde Bruxelles - Capitale / Brussels Hoofdstedelijk Gewest	South Yorkshire	ÖvreNorrland	Vest
5	Inner London	Litauen	Schwaben	Severentsentralen
6	Berkshire, Bucks and Oxfordshire	Emilia-Romagna	Oberösterreich	Nord-Vest
7	Bedfordshire, Hertfordshire	Limousin	Oberpfalz	Sud
8	Etelä - Suomi	Lombardia	Bourgogne	Nord-Est
9	Surrey, East and West Sussex	Provincia Atonoma Bolzano - Bozen	Thüringen	Centru
10	Hampshire and Isle of Wight	La Rioja	Smålandmedöarna	Dél-Alföld
11	Noord - Brabant	Lazio	Itä-Suomi	Yuzhentsentralen
12	Wien	Közép - Magyarország	Zeeland	Sud-Est
13	Luxemburg (Grand - Duché)	Champagne-Ardenne	Detmold	Podkarpackie
14	Prov. Vlaams Brabant	Liguria	EastRidingandNorthLincolnshire	Yugoiztochen
15	North Eastern Scotland	Provincia Autonoma Trento	Oberfranken	Severoiztochen
16	Utrecht	Friuli - Venezia Giulia	Brandenburg-Südwest	Észak-Magyarország
17	Hamburg	Castilla y León	Basse-Normandie	Kujawsko-Pomorskie
18	Prov. Brabant Wallon	Slowenien	Languedoc-Roussillon	Opolskie
19	Gloucestershire, Wiltshire and North Somerset	Martinique (FR)	Brandenburg-Nordost	Severozapaden
20	Noord - Holland	Comunidad Valenciana	Halle	Lubuskie

Figure 10: Rank in economic setting and Lisbon orientation according Lisbon performance

SPATIAL DATA ANALYSIS, MULTIREGIONAL MODELLING AND MACROECONOMIC GROWTH

by Attila Varga

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Attila Varga gives an overview of the current state of the geographical innovation and growth literature and of the main methodological issues in this field that interlink geography with technological change and macroeconomic growth. He outlines that it is a complex task to integrate spatial structure into economic growth explanations and that only the most recent economic geography models investigate the general equilibrium in a spatial setting. Finally, Attila Varga surveys research efforts in the area of geographical innovation and growth and suggests an integrated approach where macroeconometric modelling is extended by a model of spatially mediated knowledge spillovers.

Introduction

Since the seminal article of Solow (1957) it is generally acknowledged in economics that technological progress constitutes the most important factor in long-run growth. The endogenous economic growth school stands out from the literature with its intention of explicitly modeling technological change resulting from profit-motivated economic behavior in accordance with the neoclassical theoretical framework. Despite that this framework does not allow for the treatment of technological progress in its entire complexity compared to alternative approaches such as the innovation systems literature the endogenous school's enduring influence on economics is unquestionable as it has opened the avenue of a more realistic modeling of economic growth and the impacts of economic development policies.

The role of geography in technological change has been studied widely in the recent empirical economics literature (Jaffe et al. 1993, Anselin, Varga and Acs 1997). Research interest towards geography is significantly motivated by the observation that innovation activities have a predominant tendency to cluster spatially as demonstrated by recent studies (e.g., as exemplified for the US by Varga 1999 or for the European Union by Caniels 2000). Sensitivity of the transmission of tacit knowledge to physical distance provides one of the principal reasons for the development of regional innovation clusters since the transfer of non-codified knowledge elements frequently requires close personal interactions (Polanyi 1966). Thus, relative spatial position of the actors in knowledge creation is a potentially significant factor in technological change and eventually in economic growth.

At least from the work of Marshall (1890) economists are aware of the role spatial externalities play in production. Positive agglomeration economies such as localized knowledge spillovers, labor pooling or input sharing decrease production costs resulting from the fact that firms and people concentrate in space. As such spatial structure of economic activities is itself a factor of production. However, until the appearance of the "new economic geography" in the recent decade mainstream economics remained basically an "a-spatial" intellectual construction. Incorporation of space into economic theory by the new economic geography can indeed be characterized as "a new recipe with old ingredients". It builds on insights from various sources such as regional science, economic geography, location theory, urban economics, the general equilibrium model with monopolistic competition and the

"new" trade theory. The particular mixture of these elements first created by Krugman (1991) is a definitely original contribution to economics: a spatial general equilibrium model of the economy.

An important step towards understanding how the geography of technological change relates to economic growth is integrating new economic geography and endogenous growth theory. The most recent models of the new economic geography study macroeconomic growth in a spatial setting. The role of knowledge spillovers in the formation of spatial economic structure and the resulting long-run equilibrium level of economic growth are treated in an integrated analytical framework (Fujita and Thisse 2002).

The empirical literature investigating agglomeration and macroeconomic growth is still in its early stage of development (Ciccone 2002, Acs and Varga 2005). Furthermore, though several traditional regional econometric models exist, it is a very recent advancement that geographical structure is modeled simultaneously with other variables in macroeconomic models (Schalk and Varga 2004). The few examples of computable general equilibrium (CGE) models of this type are Thissen (2003) and Koike and Thissen (2005).

It should be highlighted here that the role of spatial structure in macroeconomic growth is not an issue with academic relevance only. Understanding it has potentially high importance for economic policy making as well. The debate in the European Union on the most efficient geographical distribution of CSF (Community Support Framework) assistance is an excellent case in this respect. Should the EU continue its current regional policy with a dominant focus on cohesion or a shift to the promotion of technological progress in the more advanced regions is the most promising option for the Union as a whole (Midelfart-Knarvik and Overman 2002)? Understanding how spatial economic structure develops, what role policy can play to influence it and the manner a particular geographical pattern of an economy impacts macro-level performance and regional convergence would be essential in the design of such regional economic policies.

This paper serves two purposes. First, it provides an account of the current state of the geographical innovation and growth literature and, second, it overviews the main methodological issues in the field that interlinks geography with technological change and macroeconomic growth. The following section outlines an empirical modeling framework to be used to determine where the research stands in modeling geographical growth and what the main methodological problems of the field are. The second and third sections deal with the current state of empirical research and issues of methodology, respectively. Finally, a summary concludes the article.

Technological progress, spatial structure and macroeconomic growth: An empirical modeling framework

It is a very complex task to integrate spatial structure into economic growth explanation. Essential elements of this "geographical growth explanation" are rooted in three separately developed recent literatures (Acs and Varga 2002): the endogenous growth theory (Romer 1990), the systems of innovation school (Nelson 1993), and the new economic geography literature (Krugman 1991, Fujita and Thisse 2002). This section provides a framework to integrate elements of these three approaches in a consistent manner to guide empirical research in the field of geographical innovation and growth.

It is important to emphasize that this paper does not aim to develop a formal theoretical model. As far as I understand the state of the art given the extreme complexity of the problem formal modeling might no even be possible at least with the instruments currently available. Even for empirical treatment research should use a mixture of tools and as such the suggested set of methodologies is eclectic.

The three approaches focus on different aspects but at the same time are also complements of each other. The "new" theories of growth endogenize technological change and as such interlink technological change with macroeconomic growth. However, the way technological change is described is strongly simplistic and the economy investigated gets formulated in an a-spatial model. On the other hand, systems of innovation frameworks are very detailed with respect to the innovation process but say nothing about macroeconomic growth. However, the spatial dimension has been introduced into the framework in the recently developed "regional innovation systems" studies (e.g., Braczyk, Cooke, Hedenreich 1998). According to Cooke et al (2004) "a regional innovation system consists of interacting knowledge generation and exploitation sub-systems linked to global, national and other regional systems for commercializing new knowledge".

The idea behind the innovation systems approach is quite simple but as such extremely appealing. According to this in most cases innovation is a result of a collective process and this process gets shaped in a systemic manner. The elements of the system are innovating firms and firms in related and connected industries (suppliers, buyers), private and public research laboratories, universities, supporting business services (like legal or technical services), financial institutions (especially venture capital), and the government. These elements are interconnected by innovation-related linkages where these linkages represent knowledge flows among them. Linkages can be informal in nature (occasional meetings in conferences, social events etc) or they can also be definitely formal (contracted research, collaborative product development etc). The effectiveness (i.e., productivity in terms of number of innovations) of the system is determined by both the knowledge already accumulated by the actors and the level of their interconnectedness (i.e., the intensity of knowledge flows). Ability and motivations for interactions are shaped largely by traditions, social norms, values and the countries' legal systems.

New economic geography models investigate general equilibrium in a spatial setting. This means that they provide explanations not only the determination of equilibrium prices, incomes and quantities in each market but also the development of the particular geographical structure of the economy. In other words, new economic geography derives economic and spatial equilibrium simultaneously (Fujita, Krugman and Venables 1999, Fujita and Thisse 2002). Spatial equilibrium arises as an outcome of the balance between centripetal forces working towards agglomeration (such as increasing returns to scale, industrial demand, localized knowledge spillovers) and centrifugal forces promoting dispersion (such as transportation costs). Until the latest developments in recent years new economic geography models did not consider the spatial aspects of economic growth. However even in the recent models explanation of technological change follows the same pattern as endogenous growth models and as such fail to reach the complexity inherent in innovation systems studies.

To develop an empirical modeling framework of geographical growth explanation I extend the endogenous growth model in Romer (1990). For a bit more formal

treatment I apply the generalized version of the Romer (1990) equation of macroeconomic level knowledge production developed in Jones (1995)[1]:

$$dA = \delta H_A^{\lambda} A^{\varphi}$$

where H_A stands for human capital in the research sector working on knowledge production (operationalized by the number of researchers), A is the total stock of technological knowledge available at a certain point in time whereas dA is the change in technological knowledge resulted from private efforts to invest in research and development. δ, λ and φ are parameters.

Technological change is generated by research and its extent depends on the number of researchers involved in knowledge creation (H_A). However, their efficiency is directly related to the total stock of already available knowledge (A). Knowledge spillovers are central to the growth process: the higher A the larger the change in technology produced by the same number of researchers. Thus macroeconomic growth is strongly related to knowledge spillovers.

Parameters in the Romer knowledge production function play a decisive role in the effectiveness of macro level knowledge production. The same number of researchers with a similar value of A can raise the level of already existing technological knowledge with significant differences depending on the size of the parameters. First, consider δ ($0<\delta<1$) which is the research productivity parameter. The larger δ the more efficient H_A is in producing economically useful new knowledge.

The size of φ reflects the extent to which the total stock of already established knowledge impacts knowledge production. Given that A stands for the level of codified knowledge (available in books, scientific papers or patent documentations) I call φ as the parameter of codified knowledge spillovers. The size of φ reflects the portion of A that spills over and as such its value largely influences the effectiveness of research in generating new technologies.

λ is the research spillover parameter. The larger λ the stronger the impact the same number of researchers plays in technological change. In contrast to φ and δ that are determined primarily in the research sector and as such their values are exogenous to the economy λ is endogenous. Its value reflects the diffusion of (codified and tacit) knowledge accumulated by researchers. Diffusion depends first on the intensity of interactions among researchers (H_A), second the quality of public research and the extent to which the private research sector is connected to it (especially to universities) by formal and informal linkages and third the development level of supporting/connected industries and business services and the integration of innovating firms into the system via links to them. The extensive innovation systems literature evidences that the same number of researchers contribute to different efficiencies depending on the development of the system. In the Romer equation this is reflected in the size of λ.

[1] The functional form corresponds to the Jones (1995) version, however, the interpretation of λ and φ is different in this paper.

λ is also sensitive to the spatial structure of HA. A series of papers (e.g., Jaffe at al. 1993, Anselin, Varga and Acs 1997) demonstrates that a significant fraction of knowledge spillovers is bounded spatially. A specific characteristic of knowledge communication explains this observation. The effectiveness of knowledge transmission in space seems to be directly related to the degree of codification. While codified knowledge can easily be transported over large distances in written forms (e.g., in scientific papers, patent documentations) tacit knowledge transmission relies on more complex, non-written types of communication that require personal interactions. Thus, access to this knowledge might be limited to those only who locate in the proximity of the knowledge source and as such spatial proximity of R&D labs and to academic research could increase the effectiveness of innovation. Geographical proximity may also ease maintaining connections between firms and also with business services as it speeds up information flows or helps build trust and the common language of communication. As a result even with the same number of researchers λ can have different values depending on the geographical structure of the system of innovation.

Insights from the new economic geography can help understand the dynamic effects of the spatial structure of R&D on macroeconomic growth. If spatial proximity to other research labs, universities, firms and business services matter in innovation firms are motivated to locate R&D laboratories where actors of the system of innovation are already agglomerated in order to decrease their costs to innovate. Thus spatial concentration of the system of innovation is a source of positive externalities and as such these externalities are centrifugal forces in R&D location. However, agglomeration effects could be negative as well. Increasing housing costs and travel time make innovation more expensive and might motivate labs to move out from the region. The actual balance between centrifugal and centripetal forces shapes the geographical structure of the system of innovation. Through determining the size of λ in equation (1) this also influences the rate of technological progress (dA/A) and eventually the macroeconomic growth rate (dy/y).

Equations (1) to (6) summarize the empirical modeling framework of geographical growth explanation. Equation (1) describes the relationship between innovation output (K) and regional inputs to innovation in region r: private research (RD), public/university research (URD) and the additional actors of the regional system of innovation such as business services, related/connected firms as summarized in variable Z:

(1) $K_r = K (RD_r, URD_r, Z_r)$.

A significant relationship between RD and K reflects the importance of geography in innovation and eventually in economic growth. Equations (2) to (6) actually model this relationship.

The regional effect of an increase in private R&D on innovation depends on research already in the region as well as on the presence of additional innovation inputs, URD and Z:

(2) $\partial K_r/\partial RD_r = F (RD_r, URD_r, Z_r)$.

Parameters of RD, URD and Z are determined by several factors exogenous to the economy such as the willingness to cooperate in innovation, the structure of

research expenditures at universities, local regulations and so on. The marginal effect of R&D on innovation reflects agglomeration economies/diseconomies in innovation and as such affects R&D location:

(3) $dRD_r = R(\partial K_r/\partial RD_r)$.

Positive effects (agglomeration economies) act as centripetal forces whereas negative effects (agglomeration diseconomies) are centrifugal forces in R&D location. The spatial distribution of R&D is determined by regional differences in the marginal effect of research on innovation. In spatial equilibrium $\partial K_r/\partial RD_r$ is the same for all the regions and $dRD_r=0$.

Geographical structure of research (GSTR(HA)) determines λ:

(4) $\lambda= \lambda (GSTR(H_A))$,

where $H_A= \Sigma_r RD$.

The rest of the equations are from the Romer-Jones model:

(5) $dA = \delta H_A^{\lambda} A^{\varphi}$,
(6) $dy/y = H(dA, Z_N)$,

where dy/y is macro level per-capita growth rate and Z_N is additional variables of the model (not detailed here).

Geographical growth studies: methodological issues

A review of the literature (Varga 2006) suggests that a disproportionally high number of papers study the geography of knowledge spillovers whereas issues such as the role of agglomeration in spillovers, location of R&D facilities not to speak integrated approaches to understand the role of geography in innovation and growth are relatively neglected. This could be quite much surprising considering that many of the knowledge spillover studies are motivated by the interest in the spatial dimension of macroeconomic growth.

What could explain this situation? One reason might be that the field is relatively young. Empirical interest goes back to the eighties only and the integrated theory in the form of the new economic geography is a result of an even more recent development. These could explain to a certain extent why theoretical models dominate. However, there might be methodological reasons as well. Difficulties related to the treatment of spatial dependence, integration of macro and regional levels in analyses and the challenges of dynamic spatial macro modeling are detailed in this section.

Dependence in space: Spatial data analysis in knowledge spillover research

There is an observed tendency of innovation activities to cluster in space. This means that high values of innovating spatial units tend to be surrounded by other high value units and a similar pattern apply to low value places. Spatial clustering in general is a consequence of dependence among spatial units. Spatial dependence implies a functional relationship between the observed values for the same variable in different locations. Whereas dependence in time is considered as a one directional relationship between two observations, dependence in space is two directional

among several locations. Values of a given variable determine and at the same time are determined by values of the same variable at different locations.

Dependence in space is a result of two different phenomena, one technical and the other fundamental. The technical reason is measurement error. Typical data used for spatial analysis are aggregated by political units (counties, states) but the process of interest may operate at a different geographical scale. As a result, values spill over the boundaries of aggregation creating correlations among spatial units. Dependence among values can be present even if the aggregation of data is correct. It comes from the fact that the intensity of interactions between spatial units is determined by distance. The size of interactions is negatively related to distance.

The presence of spatial dependence makes traditional econometric techniques no longer appropriate for spatial data analysis (Anselin 1988, 2001). In these cases the toolbox of spatial econometrics provides statistically correct estimations. However, the advantage of spatial econometrics over more generally applicable methodologies is rooted not only in statistical criteria. There is a substantive reason as well as spatial econometrics provides tools to model spatial externalities empirically.

Exploratory and econometric methodologies in spatial data analysis can be very usefully applied in empirical research when the role of geography in innovation and growth is investigated. This sub-section shortly reviews frequently applied techniques of exploratory spatial data analysis (ESDA) and provides arguments for the substantive relevance of spatial econometrics. At the end of this sub-section the popularity of spatial econometrics among researchers in the geographical growth field is assessed.

In order to treat geography in statistical and econometric analyses an appropriate solution to represent spatial positions is in need. A widely used method to put structure on spatial arrangement is to consider spatial units as neighbors in different orders. Depending on their relative distance, observations are arranged into neighborhood classes. First order neighbors represent the closest units in space. Neighbors having a common border (contiguity-based neighborhood concept) or being within a critical distance band (distance-based neighborhood concept) may be the closest observations. Relative positions of observations in a given neighborhood class are represented in spatial weights matrices. The dimension of the weights matrix (W) is equal to the number of observations (N). For binary contiguity matrices, an element wij of the matrix can take values of either zero or one. When observations i and j are neighbors, the given value of the matrix is one. By convention, the diagonal elements of the weights matrix are set to zero. In general, binary contiguity matrices are symmetric[2].

The basic principle behind the different ESDA tools to quantify clustering is the same in each statistic. Because clustering means that similar values concentrate in the same neighborhood, these measures compare neighborhood patterns with value similarity patterns. Weights matrices (based on common borders or critical

[2] An alternative way of representing spatial positions in a given neighborhood class is to construct row standardized spatial weight matrices. In several cases, row standardization makes the statistical results easier to interpret. Row standardized weights are calculated from binary contiguity matrices. Each element in the ith row is divided by the row sum. The elements of the row standardized matrix take values between zero and one. The row sum of the values is always one.

distance) model neighborhood patterns. To model the patterns of value similarity, different measures are used depending on the particular form of the tests.

The general product moment structure of the *gamma index* developed by Hubert et al. (1985) presents the base form of any statistic of spatial association:

(7) $\Gamma = \Sigma_{i,j} w_{ij} c_{ij}$,

where w_{ij} is an element of a weights matrix and c_{ij} is an element of a matrix that measures value similarity. If location i and j are neighbors, w_{ij} is different from zero and zero otherwise (w_{ii} =0). The most frequently used global measures of spatial autocorrelation are Moran's I and Geary's C (Moran, 1948, Geary, 1954)[3].

Anselin (1995) defines local indicators of spatial autocorrelation (LISA) as statistics that satisfy two requirements: they are local indicators of significant clustering, and the sum of LISA is proportional to a global indicator of spatial association. Local Moran is calculated for any observation i such that

(8) $l_i = z_i \Sigma_j w_{ij} z_j$,

where l_i is the local Moran for observation i, and z_i and zj are values in deviations from the mean. The term $\Sigma_j w_{ij} z_j$ calculates the weighted average of neighboring values for observation i, and w_{ij} is an element of a weights matrix in row standardized form[4].

Figure 1 provides a Local Moran map of patent applications aggregated by US counties for the year 1992. Dark colors indicate significant positive spatial autocorrelation that is the county with high (or low) level of patent activities is surrounded by similarly active (or passive) counties. Significant negative spatial autocorrelation is signed by light colors on the map: high (low) innovation counties are surrounded by others with low (high) innovation. While it is straightforward to give substantive meaning to positive autocorrealation (i.e., spatial clustering) this is not that easy for negative spatial association. However, the interest in innovation research is mainly in locating clusters of innovation activities and for this LISAs are extremely powerful and easy to understand tools in empirical research as illustrated in Figure 1 (available in the annex for colour maps).

In geographical innovation and growth research understanding the spatial nature of interactions among actors in the system of innovation potentially leading to spatial externalities is crucial. Can knowledge be transferred over large distances or knowledge communication needs close spatial proximity of actors in the system of innovation? How far is "far" and how close is "close"? Spatial econometrics provides various models with high intuitive value for studying spatially mediated knowledge spillovers. The followings draw on the typology of models of spatial externalities in Anselin (2003) and consider linear regression with continuous dependent variables for cross-sectional data.

[3] Moran's I and Geary's c statistics test spatial autocorrelation among variables xi for N observations:
$I = (N/\Sigma_{i,j} w_{ij}) \Sigma_{i,j} w_{ij} (x_i - \mu)(x_j - \mu) / \Sigma_i (x_i - \mu)^2$
$c = \{(N-1)/2\Sigma_{i,j} w_{ij}\} \Sigma_{i,j} w_{ij} (x_i - x_j)^2 / \Sigma_i (x_i - \mu)^2$
where w_{ij} are the elements of the spatial weights matrix, and μ is the mean of x.

[4] Significance tests for local Moran can be based on a randomly permuted distribution of statistics, under the null hypothesis of no local spatial dependence.

The starting point is the classical linear regression equation:

(9) $y = X\beta + \varepsilon,$

where y is innovation output whereas the matrix X contains variables potentially affecting innovation, β is a vector of parameters and ε is a vector of error terms. The most frequently used innovation output measures are innovation counts and patents (Acs, Anselin and Varga 2002). In (9) data are aggregated by spatial units (regions).

To what extent equation (9) can be considered as an appropriate model of regional innovation? It basically depends on the spatial extent of interactions among the actors of the regional system of innovation. If linkages among innovating firms and related/supporting companies, private and public research laboratories and business services do not cross the regional border, equation (9) can represent the innovation process correctly. However, it might not be true that innovation-related interactions are constrained in the region only.

The two main issues in modeling the geographical aspects of innovation are (1) what is the spatial extent of them (that is how far those linkages are maintained) and (2) how to represent them in the model (direct or indirect representations). With respect to the first issue interactions might extend to nearby regions only (local autocorrelation) or they can last for large distances, although with decreasing intensities as distance from the region increases (global autocorrelation).

Regarding alternative econometric modeling of interactions in equation (9) either direct or indirect representation is possible. When the first option is followed geographical extent is modeled by directly accounting for the effects of spatially lagged independent variables (i.e., by observed values of the same explanatory variables in distant regions). In case spatial dependence is considered as a nuisance (indirect modeling) the effect of interactions extending the region is delegated to the error term.

The spatial autoregressive model (SAR) is the most commonly applied in global autocorrelation modeling. Formally

(10) $\varepsilon = \lambda W\varepsilon + u,$

where ε is a vector of error terms, λ is the spatial autoregressive parameter, W is the weights matrix and u is a vector of independently distributed error terms with variance σ^2. After solving (10) for ε we get

(11) $\varepsilon = [I - \lambda W]^{-1} u.$

In the variance-covariance matrix of ε every location is correlated with every other location but correlation is higher for closer locations. As such, the correlation structure associated with the term $[I - \lambda W]^{-1}$ is the so-called global auto-correlation.

An alternative way of modeling spatial processes is to assume that interactions are local. The corresponding error specification is SMA (spatially moving average):

(12) $\varepsilon = [I + \gamma W] u.$

The lack of an inverse term in (12) results in that spatial covariance is "local" that is beyond two "bands" of neighbors, the spatial covariance is zero for W as a first order contiguity matrix (Anselin 2003, p.5).

Spatial dependence can be modeled either directly or treated as a "shock" in the error term. For direct modeling a widely applied option is the following solution:

(13) $y= (I - \varrho W)^{-1} X\beta + (I-\lambda W)^{-1} u.$

The inverse term the matrix of independent variables are multiplied with results in spatially lagged explanatory variables under the assumption that externalities are global. After re-arrangements (13) results in the so-called spatial lag specification:

(14) $y= \varrho Wy + X\beta + u.$

An alternative modeling of spatial dependence is to consider it as nuisance. An example could be the approach when the focus is on modeling interactions within the region while correcting for the effects of inter-regional interactions by accounting for them in the error term:

(15) $y= X\beta + (I-\lambda W)^{-1} u.$

In equation (15) the assumed spatial pattern of interactions is "global" with a decreasing strength as distance increases.

It is not the purpose of this article to go through all the possible variations of local/global and modeled/unmodeled cases. I just want to provide some insights into the most frequently used approaches. Of course the major question is how to select among the different modeling possibilities. Basically two solutions have been developed in the literature. One suggests to base the decision on the results of specification tests (Anselin 2003) while the other stresses the importance of substantive reasoning that is to select the spatial process in accordance with some previous knowledge about the subject. Fingleton and López-Bazo (2005) for example argues that in regional growth models only the spatial lag specification (14) is appropriate and in case specification tests suggest spatial error dependence (15) this is basically the result of omitting variable bias.

Spatial macro modeling: Integrating macro and regional levels

A further methodological problem occurs when models of regional level innovation (equations (1) to (3)) need to be integrated with macro level equations (models (5) and (6)). The two geographically different dimensions are supposed to be connected by equation (7). According to the author's knowledge this is an issue that has not been considered in the literature with the exception of the works of Schalk and Varga (2004) and Varga and Schalk (2004). This sub-section shortly reviews the solution applied in EcoRET the macroeconometric model with regionally endogenized technological change for the Hungarian economy (Schalk and Varga 2004)[5].

[5] EcoRET (macroECOnometric model with Regionally Endogenized Technological change) was originally built for the purpose of ex-ante evaluating the macroeconomic effects of the 1st Hungarian National Development Plan. The unique feature of EcoRET as compared to the tradition in macroeconometric modeling is that it incorporates spatial structure into a traditional macromodel. It can be applied for policy simulations on the macroeconomic effects of changing geographical distribution of regional financial supports.

The major difference between EcoRET and other macroeconometric models is the explicit treatment of technology as an explanatory variable in those relationships on the supply side where it enters because of theoretically founded reasons. Adequate modeling of technological change requires the incorporation of the spatial dimension into the framework. Arguments for this are deeply rooted in recent developments of economics such as endogenous growth models, systems of innovation literature and the new economic geography.

EcoRET is divided into four main blocks: the supply side block (including labor market, production, productivity, investment, employment and unemployment, production costs and inflation); the demand side block (households, government consumption, foreign trade etc); the income distribution block (private and government income, transfers of income); the Total Factor Productivity (TFP) block modeling changes in regional technological level. The complete actual version of the model contains 106 variables, 32 of them are explained by behavioral or technical relationships, 16 variables are exogenous while the remainder of the endogenous variables is explained by definitional identities.

To account for the geography effect in knowledge production we separated knowledge inputs into three classes depending on their spatial origin: knowledge sources accessible by way of personal connections (local knowledge); knowledge to be accessed by anyone of the country (codified knowledge); international knowledge sources (mediated e.g., by foreign direct investments). We also accounted for the effects of other regional factors potentially relevant for TFP growth such as physical infrastructure and human capital.

The empirical model has the following form:

$$(16)\quad TFPGR_{i,t} = \alpha_0 + \alpha_1 KNAT_t + \alpha_2 RD_{i,t} + \alpha_3 KIMP_{i,t} + \alpha_4 INFRAINV_{i,t} + \alpha_5 HUMCAPINV_{i,t} + \varepsilon_{i,t},$$

where TFPGR is the annual rate of growth of TFP; KNAT is domestically available technological knowledge accessible with no geographical restrictions measured by the stock of (nationally or internationally invented) domestically registered patents the documentation of them is accessible for anyone located in the country with no geographical restrictions; RD stands for private and public local R&D (measured by expenditures); KIMP is imported technologies measured by the share of foreign direct investments in total private investments; INFRAINV is annual change in investment in physical infrastructure; HUMCAPINV is annual change in investment in human capital, i stands for region and t is time.

The macroeconomic blocks of EcoRET are estimated on the time domain whereas the TFP block is regionalized. As such, linking the changes in TFP growth rates generated by certain policy interventions at the regional level (such as changes in R&D expenditures, infrastructure or education investments) to the rest of EcoRET represented a definite challenge. To solve the problem we relied on theoretical and empirical research of agglomeration and technological change (e.g., Fujita and Thisse 2002, Varga 2000). This literature indicates a positive relationship between agglomeration and technological development.

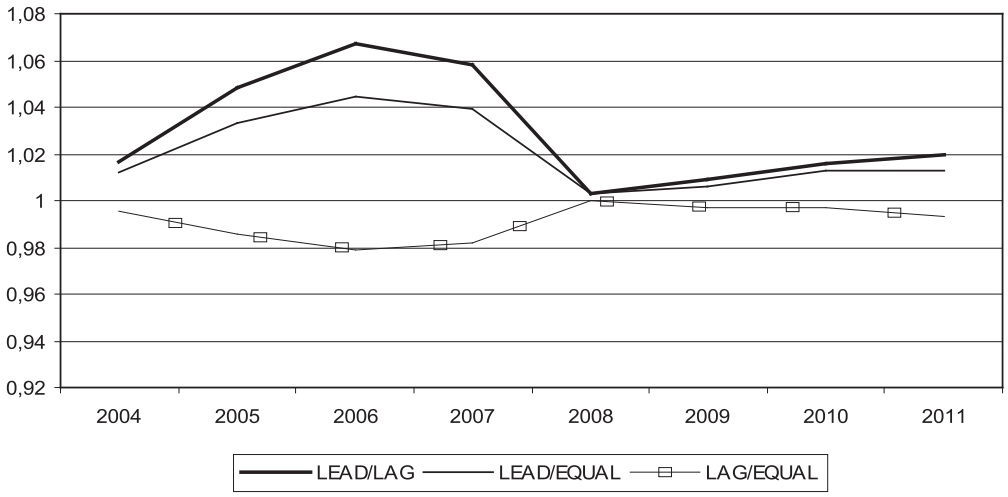
The following approach was taken. First, in the TFP block we calculated the changes in TFP growth rates as a result of policy interventions for each county with the

estimated TFP equation and to account for the agglomeration effect in technological change we weighted averaged the resulted values with a variable (regional employment) reflecting economic size of regions to get the change in the national TFP growth rate. Note that the validity of this approach was carefully checked and based on that the regional TFP block and the macroeconomic blocks of EcoRET provide extremely close estimations for the national TFP growth rate.

The change in TFP growth rate calculated in the TFP block feeds into the macroeconomic model as it is included in the macro level technology equation. For example, for year t we calculated the national TFP level in the following manner:

$$(17) \qquad TFP = TFP_{-1} e^{\mu} e^{DNTFPGR}$$

where TFP is the level of national TFP, μ is the estimated growth rate of technology in the macroeconomic blocks, DNTFPGR is the change in the national TFP growth rate (calculated as a weighted average of the changes in regional TFP growth rates). Thus equation (17) is the key equation to link the TFP block to the rest of the empirical model. The simulated new national TFP value in equation (17) channels the TFP block results into the macroeconomic blocks as TFP feeds directly or indirectly into several macroeconomic equations of the system (such as GDP, employment, unemployment, inflation and so one).



Source: Simulations in EcoRET
Figure 2: The effect of geography on national growth rate: The ratio of the growth effects of concentrating CSF resources in leading, lagging areas vs. equal distribution

Figure 2 provides an example as to how the geography effect of EU Community Support Funds (CSF) on macroeconomic growth in Hungary is simulated by EcoRET. Three scenarios are considered: supporting leading regions only, restricting support to lagging areas and equal spatial distribution of funds. Figure 2 shows the relative effects of different scenarios on macroeconomic growth. It is clear that supporting more advanced regions have the definitely largest effect on the national growth rate although the ratios to the scenarios targeting lagging areas and equal distribution are changing over time. It is also depicted in the figure that supporting lagging areas does not appear to be a successful strategy even when compared to equal distribution if national growth is targeted.

Endogenizing spatial structure

As detailed in the previous two sub-sections, many of the empirical models use spatial econometrics to study geographically mediated knowledge spillovers. On the other hand, only one model comes closest to the system of equations described in section 2. EcoRET builds (1), (2), (4), (5) and (6) into the system of macroeconometric equations. As a result, the model is capable of simulating macroeconomic effects of development policies assuming different spatial distributions of financial support. However, equation (3) is not included in EcoRET as location of R&D is not modeled. Thus the resulting macroeconomic effects do not involve the whole story of geographical growth. In other words in EcoRET only the short run effects of development policies are involved. In the long run such policies (infrastructure development, education investments, R&D promotion and so on) may result in a changing distribution of firms and business services or public research that potentially be followed by a change in the spatial distribution of R&D (according to equation (3)). How to make the spatial distribution of research endogenous in the system and how to build the process of changing geographical distribution of research into a model of macroeconomic growth? This is a real challenge in empirical research as it most probably needs a methodology different from econometric modeling.

One potential method to endogenize R&D location is spatial computable general equilibrium (SCGE) modeling. CGE models are numerical and empirical applications of Walrasian general equilibrium models in real world circumstances (Hosoe 1999). These models build on usual assumptions in microeconomics (i.e., utility and profit maximization, perfect competition and most recently monopolistic competition). CGE models are especially well suited to simulate the short- and long run impacts of shocks to the system. A particularly attracting feature of these models is that they do not need as many observations and details in the data as more traditional econometric techniques do.

Spatial CGE modeling is a very recent development in empirical research. A couple of examples include Oosterhaven et. al (2001), Thissen (2003), Koike and Thissen (2005). These models are the empirical counterparts of new economic geography systems. Short run SCGE models involve equilibrium in each region whereas in the long term not only each of the regions but also the whole spatial system is in equilibrium as there is no inclination by firms or households to relocate since differences across regions with respect to incomes and prices disappears resulting from a continuous change in the spatial distribution of economic activities.

SCGE models have successfully been applied to simulate regional effects of certain development policies such as highway investment. Integration of SCGE and macroeconometric models would result in a system that could account for not only regional but also macro level effects of certain economic development policies both in the short run and in the long run.

Conclusions

Until very recently macroeconomic models have been constructed with assumptions that exclude the influence of geography on macroeconomic growth. As such important growth effects of agglomeration economies have been neglected. The most recent developments in new economic geography involve theoretical models to explain macroeconomic growth in spatial settings. However, empirical research on the spatial aspects of innovation and growth is still in its infancy.

Based on an empirical modeling framework this paper surveys research efforts in the area of geographical innovation and growth. Methodological reasons for the negligence of the geography of macroeconomic growth are reviewed such as the challenges in spatial data analysis (exploratory spatial data analysis and spatial econometrics), the difficulties of integrating models of spatially mediated knowledge externalities into macroeconometric growth modeling (by the example of the EcoRET model) and the complications in endogenizing the spatial structure of research in macroeconomic growth explanations. This paper suggests an integrated approach where macroeconometric modeling is extended by a model of spatially mediated knowledge spillovers using spatial econometrics on the one hand and an endogenized explanation of R&D distribution on the other.

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SPATIAL ANALYSIS TOOLS & THE MEASURE OF TERRITORIAL COHESION

by Claude Grasland

Claude Grasland is a professor at University Paris 7 Denis Diderot, department of Geography. He is director of UMS RIATE (French ESPON contact Point) and advice director of UMR Géographie-cités (French reference team in the field of spatial analysis, urban systems, modelisation and theoretical geography). He has coordinated two ESPON projects (3.4.1 'Europe in the World' and 3.4.3 ' MAUP') and was main project partner to the synthetic cross thematic projects 3.1 'Integrated tools" and 3.2 'Scenarios'. He has published over 100 papers in the areas of human geography, demography, spatial analysis, innovative cartography, regional science and spatial planning. His research interests are in the area of spatial analysis of social facts, with a particular focus on the effects of international borders or administrative boundaries on human behaviour (barriers to flows, discontinuities in social organisations, etc.). The geographic applications are mainly concentrated in Europe (east and west) with recent enlargement of research to European neighbourhood and the World organisation.

In this paper Claude Grasland distinguishes two groups of methods that introduce the spatial dimension in territorial cohesion: territorial analysis tools and spatial analysis tools. He introduces this topic by explaining the process of "knowledge production" in European spatial planning and refers to the dialogue between scientists and policy makers as a "creative conflict". He outlines that a policy of territorial cohesion should necessarily be based on data and analysis that take into consideration the effects of spatial accessibility and territorial belonging. Finally, it is emphasised that the operationalisation of the concept of territorial cohesion needs to be based on a clear theoretical and methodological framework that considers four different dimensions. The papers is illustrated by several example derived from results of the ESPON Program (projects 3.1 and 3.2) and the Hypercarte project.

Introduction

The production of knowledge on European Spatial Planning depends on two crucial inputs which are the collection of data and the selection of tools (statistical, cartographical …) which will be used for the analysis (Figure 1). Data collection and tools selection are necessarily a place of conflict between scientists and policymakers because they do not follow the same objectives and do not share more generally the same culture. On the one hand, policymakers suspects generally scientists to use over-complicated and sophisticated methods which can not be really applied to the concrete empirical questions that they have to solve. On the other hand, scientists suspects policymakers to be over-conservative because they used always the same simple index (GDP/inh., unemployement rate) or the same simple methods (Gini coefficient, binary typologies …) despite all criticisms which have been made on scientific side. We describe this conflicts as "creative" because both partners of the conflicts has to learn from each other and to gain added value from the discussion. Policymakers can discover that new tools and new data offer the opportunity to develop new political options which were simply "unthinkable" before. Scientists can discover that the social interest of the scientific tools is not necessary proportional to their scientific complexity and that the empirical application of their research is often a way to progress on the theoretical side.

The aim of the present communication is to focus on the selection of tools which are usefull for the development of a European policy of territorial cohesion. After a brief discussion of the interest of spatial dimension we distinguish two groups of methods: territorial analysis tools and spatial analysis tools.

European Cohesion Policy: does space matter?

In a provocative paper, the geographer J. Levy noticed that *"space does not necessary offer an interesting problem to societies"*. We can indeed imagine *pre-geographical*

societies where locations of men and activities are fully determiner by natural constraints or *post-geographical societies* where the general accessibility insured by telecommunications make indifferent the location of men and activities. It is only during an intermediate period of history that *geographical societies* are interesting by spatial organisation because distance is related to a variable cost which implies that some solutions are more efficient than others. If we were living in a post-geographic society, we would still need economist (because they would remain economic differences between individuals according to their activity) or sociologist (because of remaining differences between individuals according to their belonging to social, linguistic, cultural, religious groups) or political scientists (because they would certainly remains forms of power), but we would no more need geographers, cartographers or planners!

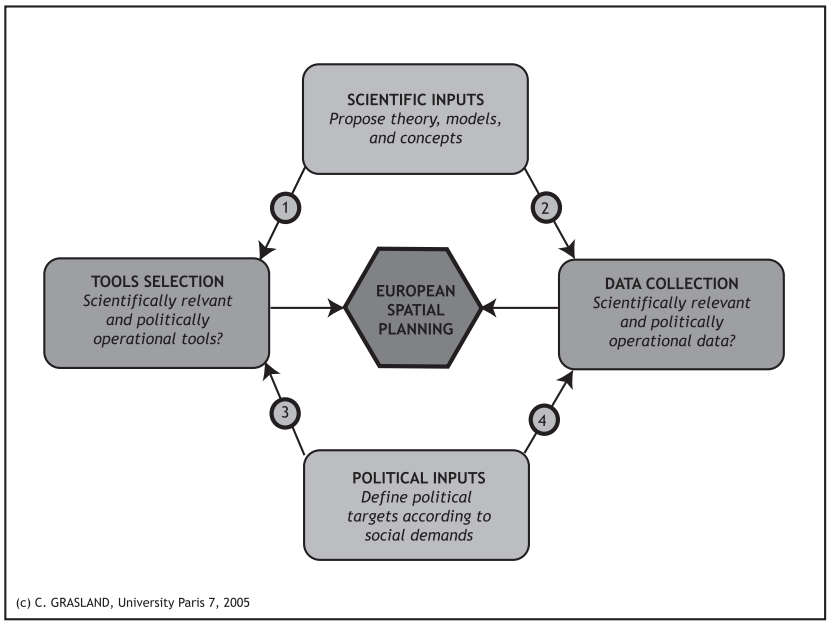


Figure 1: The chain of knowledge production in European Spatial Planning

The interest of Levy's provocation is to help us to focus on what is really the core task of spatial planner and geographers in European Union: measuring the effect of spatial accessibility and territorial organisation on the global evolution of European societies. It means that a policy of territorial cohesion should necessarily be based on databases and spatial analysis tools which take into account the effect of spatial accessibility and territorial belonging as crucial parameters to be analysed.

When we analyse for example the heterogeneity of the regional distribution of GDP/inh.in Europe with a coefficient of variation or a Gini coefficient, we do not analyse territorial cohesion but economic cohesion because the respective location of region with high and low values of GDP/inh. has absolutely no effects on the result of the measure. In many cases, the analysis of territorial cohesion is limited to the production of maps which is certainly a necessary starting point for any territorial approach but is the *"degré zero"* of spatial analysis! It is only when we introduce explicit assumption on the potential effect or spatial proximity and territorial belonging on the evolution of economic disparities that we can really develop a scientifically relevant and politically operational approach of territorial cohesion.

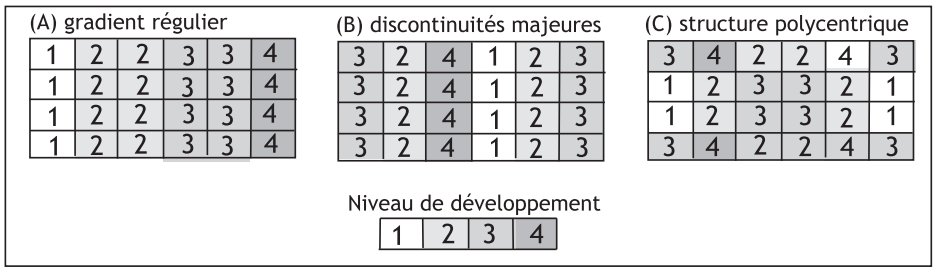


Figure 2: Spatial organisation or heterogeneity: does it matter ?

In the theoretical example presented in *Figure 2*, we have established three distributions of heterogeneity. The classical measures of statisticial heterogeneity (Gini index, coefficient of variation) are not able to distinguish these situations because they do not take into account the relative location of each spatial unit and consider therefore that the interactions which can take place between spatial units are fully independent from any form of distance. It is only if we introduce an assumption of interaction related to distance (for example the existence of spill over effects between contiguous regions) that we can establish clear differences between the three distributions which do not presents the same level of spatial autocorrelation and therefore do not offer the same potentiality of cooperation/competition between regions of different levels.

The concept of territorial cohesion will never be operational if it is not based on a clear theoretical and methodological framework. A good attempt to formalize the various dimension of territorial cohesions is the "Hypercube" that we have elaborated with P. de Boe in the framework of ESPON project 3.1 and that we present here in a simplified version.

Dimension 1: TERRITORY is a combination of space and society which means that both social and spatial dimension should be combined when analysing territorial cohesion.
Dimension 2: COHESION can be defined in a structural way as a level of homogeneity (similarity of social and spatial units) or in a systemic way as level of integration (flows and networks).
Dimension 3: MULTILEVEL ANALYSIS is necessary in every case because of scale conflicts (cohesion at one level can be related to des-integration at another one).
Dimension 4: DYNAMICS reflects the fact that cohesion is more a process than a state. Actual situation are related to past trends (inheritages) but also to future (anticipations).

All this four dimension should normally be combined when we try to develop a global approach of territorial cohesion. But in the present contribution we will focus on the spatial dimension and the question of multilevel analysis. Our purpose is not to discuss in detail the technical properties of the spatial analysis tools which has been developed by scientific research and implemented in the ESPON program but to point the theoretical scientific assumptions which are behind each particular tools and therefore there potential interest of limits for political action. The choice of the "good" tool is typically a problem which can not be solved by purely scientific or political considerations and which implies a discussion between scientists and policymakers.

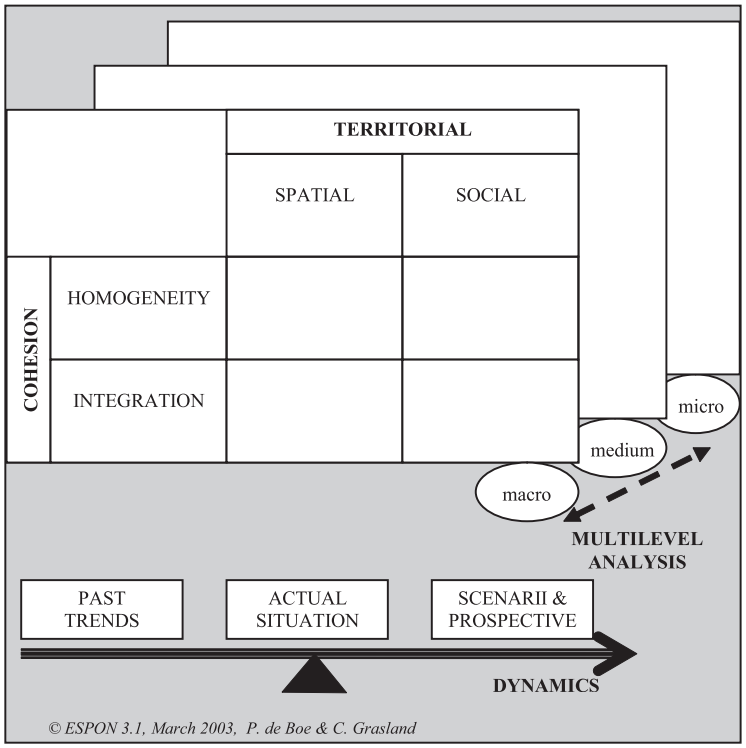


Figure 3: The Hypercube of territorial cohesion (simplified)

According to our experience of the ESPON program, it is possible to distinguish two families of methods we do not introduce the spatial dimension in the same way.

Territorial Analysis Methods

Assumptions of territorial methods
Territorial analysis methods are based on a hierarchy of territorial division (NUTS0, NUTS1, NUTS2, NUTS3 …) which are considered a priori as relevant and should not be modified or removed by spatial analysis tools. They introduced typically two kinds of distances which are discrete: Territorial Belonging (Figure 4) and Territorial Contiguity (Figure 5)

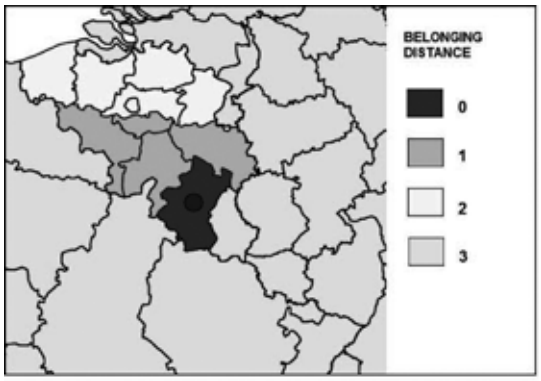


Figure 4: territorial belonging

Theoretical assumption: Regions belonging to the same unit of upper level are more likely to interact than regions separated by a border at upper level.

Political signification: Spatial planning depends from various levels of political decision (EU, States, …) which are hierarchically organised.

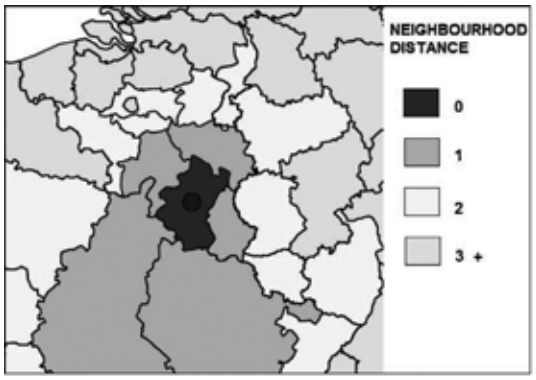


Figure 5: territorial neighbourhood

Theoretical assumption: The regions which share a common border developed specific relations that are not only related to distance.

Political signification: A common border offers opportunity of interaction which can be encouraged (INTERREG) or discouraged (Ceuta & Melilla).

Example: Multiscalar Territorial Analysis & the ESPON Hyperatlas
The Multiscalar Territorial Analysis (MTA) is a spatial analysis and cartographic software developed by the research group Hypercarte which has been implemented on European data in the framework of the project ESPON 3.1 and will be soon distributed under the name of *"ESPON Hyperatlas"*. The software Hypercarte-MTA has also been applied and tested in other countries like Cameroon, Tunisia and Romania. The basic idea of MTA is that it is not possible to evaluate the situation of a region for a given criteria without taking into account various levels and scales of neighbourhood. If we consider for example the level of unemployment of the region of Düsseldorf in 2000 (7.9%) we can consider that this level is relatively low at the global level of European Union (9.0%) , equilibrate at the medium level of Germany (8.0%) and relatively high as compare to the local level of the neighbouring regions (5.7%). The combination of the three levels of analysis provide a better view of the situation of unemployment in the region of Düsseldorf than the consideration of one single criteria and help the policymaker of different levels to decide on the better scale of action and to combine more efficiently their decisions (*Figure* 6).

It is important to notice that from scientific point of view, MTA is not a very precise tools and that in a scientific publication each of the three deviation could be replaced by more sophisticated measures like standard values (for global deviation), variance analysis (for national deviations) or spatial autocorrelation analysis (for local deviation). But on the other hand it is a great progress as compared to usual indexes provided by European Union which are generally limited to the simple cartography of the indicator and the computation of mean vale and standard deviation… What is important with this tool is that it forces policy makers to combine several scales of analysis in their strategic decisions and forces them to analyse the contradiction or complementarities which can appears at each level of action, from global to local.

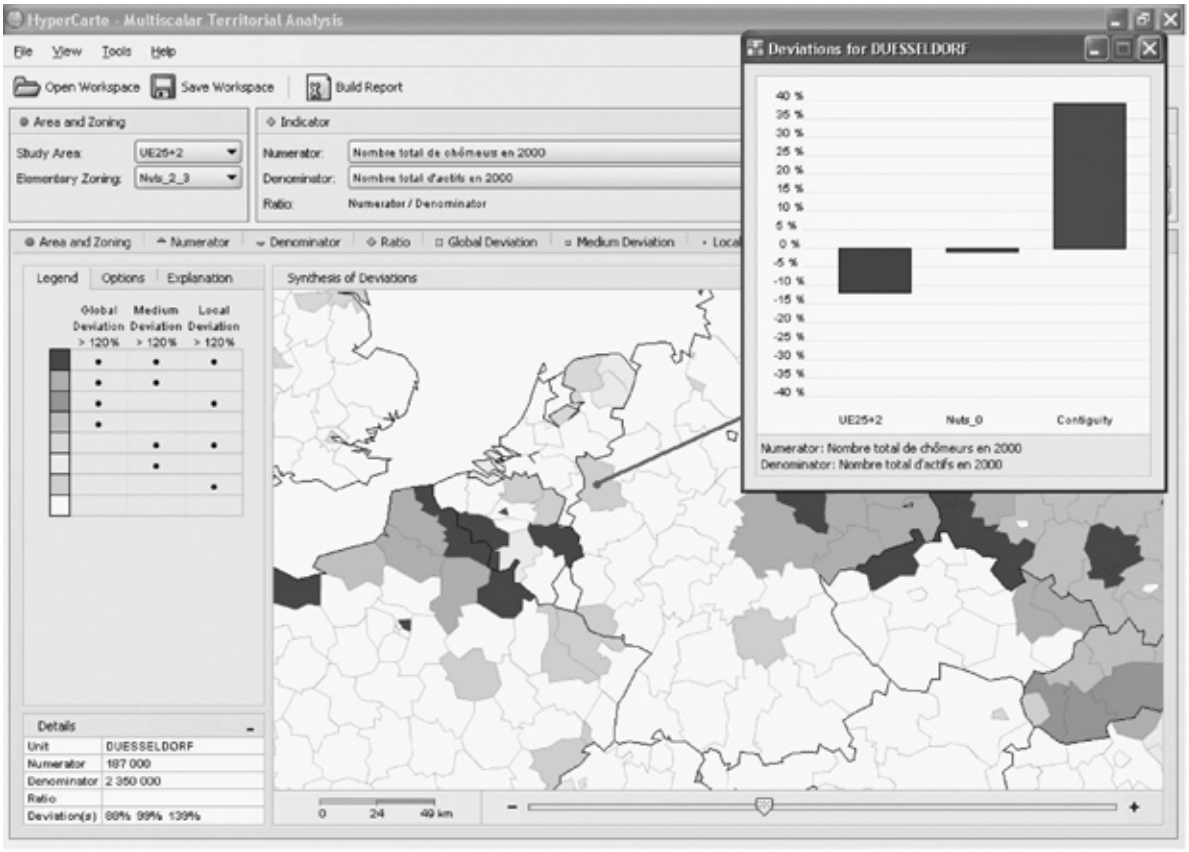


Figure 6: Application of the ESPON Hyperatlas

Spatial Analysis Methods

Assumptions of spatial methods

Spatial analysis methods are based on a various forms of distance (euclidean, cost, time, …) which are generally quantitative and continuous. The official territorial divisions (NUTS) are not considered a priori as relevant and can be eventually modified or removed. They introduced typically two kinds of distances: Spatial accessibility (isotropy, homogenity) and Network accessibility (discontinuity, anisotropy).

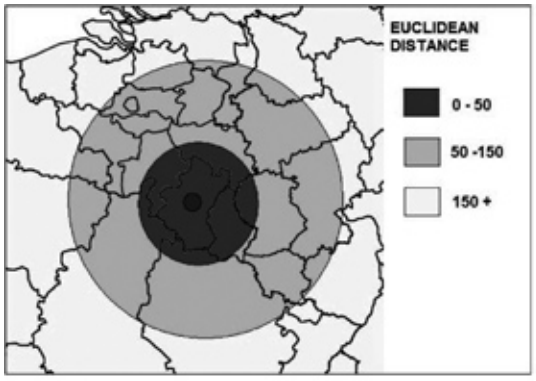


Figure 7: Spatial accessibility

Theoretical assumption: The intensity of interactions between regions decrease regularly according to continuous measures of distance.

Political signification: Euclidean distance indicates potential interactions between territories which could be developed if (1) borders effects are removed and (2) transportation system is homogeneous.

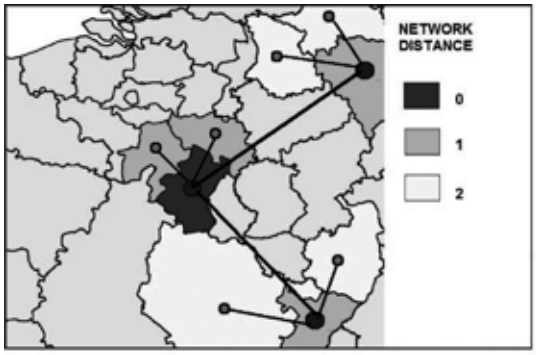


Figure 8: Network accessibility

Theoretical assumption: The anisotropy of space implies that relations are polarised by a limited number of nodes.

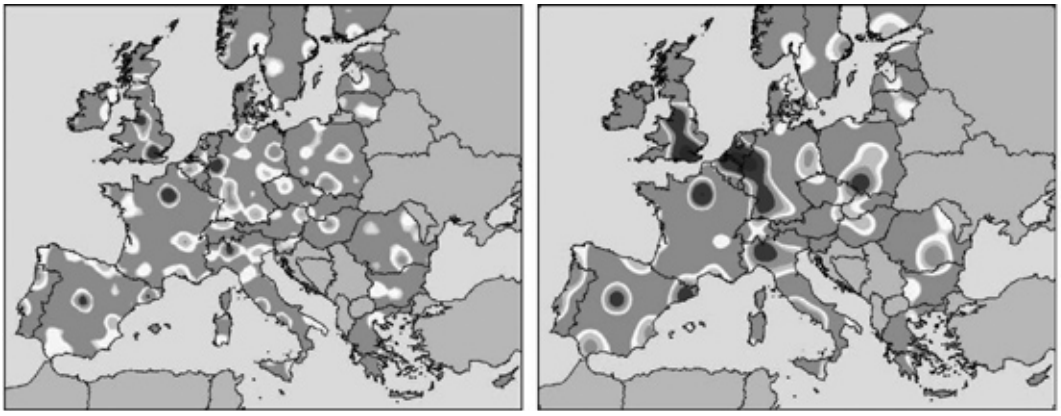
Political signification: The development of a polycentric urban and transport system can limit the concentration of population and activity around major nodes.

Example: Application of multiscalar smoothing methods
for the identification of polycentric areas of population concentration
The use of territorial divisions for the analysis of territorial cohesion is justified when the regions are supposed to be objectives dimensions of reality. But in certain case this regional division can be considered as a problem which introduce biases in the analysis of the phenomena. It is typically the case when we try to define polycentric area on a morphological criteria like population density which present a high level of scale heterogeneity with an obvious fractal form (at each level of analysis, new peaks of concentration are revealed).

The realisation of smoothed map of population density with different span of neighbourhood (gaussian neighbourhood with span 50, 100, 200 km, …) provide in a picture of population density in Europe which is not biased by the delimitation of territorial units. At each scale of neighbourhood, the picture of density is simplified and different peaks of concentration can be revealed when we compare the density for two different scales of neighbourhood. The comparison of successive scales of neighbourhood (50/100 km , 100/200km) indicate the relative density of place i.e. the location of peaks which are not defined by a precise level of density (e.g. 200 inh./km2) but by the fact that density is decreasing around them. It means that an area with a local level of 200 h/km2 will be a peak if it is surrounded by area with 100 inh./km2 but will be a hole if it is surrounded by areas with 400 inh./km2. The picture of peaks is changing according to the scales that are chosen (*Figure 9*)

It is therefore possible to combine the peaks of population identified at different scales in order to propose a synthetic picture of the polycentric structure of population distribution in Europe (*Figure 10*). The interest of this exercise is that it is based on a simple mathematic transformation of the map of population density at NUTS3, without introducing any other information like the delimitation of towns or urban

agglomeration. Despite this very poor initial information we obtain a result which seems very useful and could be easily improved by (1) introduction of functional distance instead of Euclidean or (2) combination of other criteria than population and surface…



(a) at scale 50-100km *(b) at scale 100-200 km*

Figure 9: Relative peaks of population density in Europe in 1999

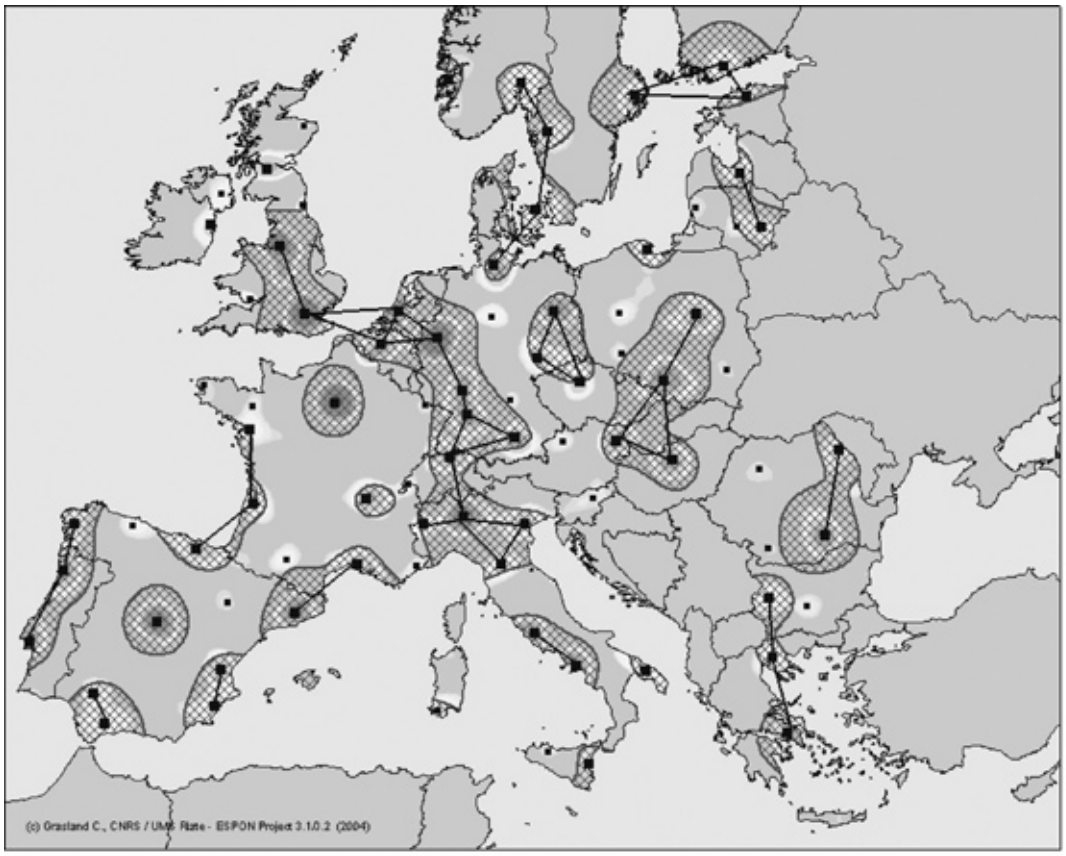


Figure 10: Polycentric structure of population density in Europe

Conclusion

We can summarize our presentation by Figure 11 which presents the different ways to introduce the spatial dimension in territorial cohesion. We have voluntary used the same design than in Figure 1 in order to underline the fact that methods based on spatial accessibility (distance and networks) are generally preferred by scientists

and methods based on territorial accessibility (belonging and contiguity) are more easily adopted by policy makers. But in our opinion, both methods are equally relevant and what is really important is to make clear the spatial or political assumptions which are behind the tools we decide to use.

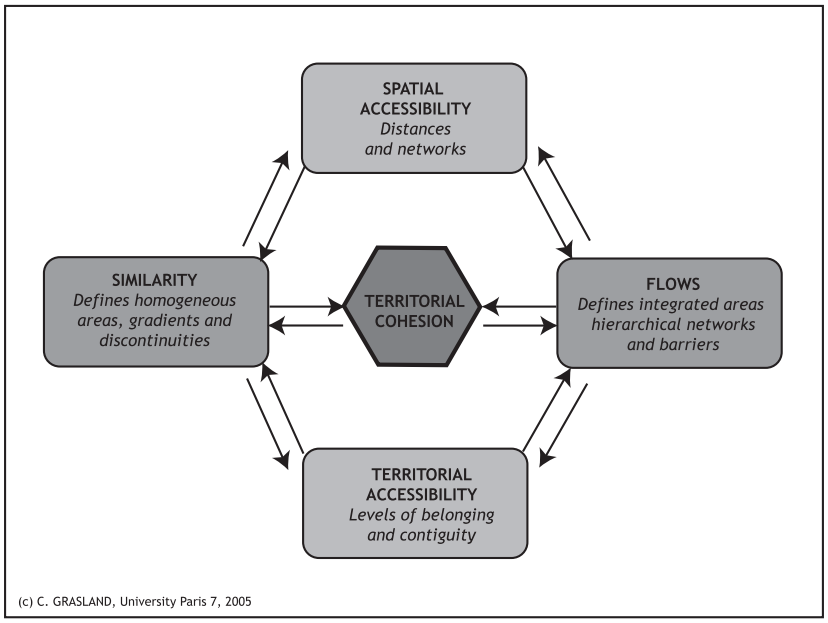


Figure 11: A Framework for spatial analysis tools applied to territorial cohesion

The second important conclusion that we want to express with this figure is the general focus of european spatial planning on questions of similarity and the lack of studies on flows. This focus on the structural dimension of territorial cohesion is certainly an effect of data shortage in the field of flows, but we should be aware that a complete vision is not possible without considering simultaneously homogeneity criteria and integration criteria and without analysing the contradiction which appears frequently between these two interlinked dimensions of territorial cohesion. When we analyse for example the situation of international cross-border areas, we observe generally that it is precisely spatial heterogeneity (e.g. discontinuities of GDP/inh.) which produce integration through asymmetric flows (e.g. cross-border flows of population and invest).

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GEOGRAPHY OF DISEQUILIBRIUM: REFLECTIONS ON HUMAN MOBILITY IN EUROPE

by Armando Montanari

Armando Montanari – professor of Urban economics, Business School, d'Annunzio University, Chieti-Pescara, Italy. Vice President of the European Society for Geography (Eugeo). Involved in multinational comparative analysis on the issues of urban and regional restructuring in Europe, and on human mobility (1979-2006). He has published about 150 books and articles, about half of them in English, French, Spanish and Japanese.

In his contribution Armando Montanari gives a brief overview of the state of European migration research and reflects on number of international projects in the field. He underlines that the complex nature of international cooperation projects makes lengthy methodological preparations necessary. This is particularly true for the much needed ambitious research considering the application of new assessment models and the creation of scenarios in order to support policy-making. He finishes his contribution by saying that social scientists need to continue their endeavours to examine how they can contribute to a demographic equilibrium by investigating human mobility in the contemporary world.

Introduction to the topic

The profound transformations that have occurred on the European continent during the last fifteen years have most certainly contributed to the radical qualitative changes that have affected, and still affect, human mobility flows on a global scale. Likewise, more specifically in the case of the European continent, over the last twenty years a demographic transition has taken place which has brought about the ageing of the population and thus a labour shortage in certain specific productive sectors. For many years migratory flows between southern and central-northern Europe have tended to be similar insofar as outflows remain significant but are still greater than inflows. Whilst within the European Union (EU) human mobility flows are largely in equilibrium, those from the rest of the world are numerous and have different characteristics.

The reconstitution of geopolitical unity in Europe led to a new awareness of the wealth of historical and cultural traditions which link the various communities together, as well as the number of borders and the intensity of relations between them. Within the European continent there exists a Schengen area, that is, those countries where human mobility is a right, where people can move freely for work, business, to visit friends and relatives, for tourism, or simply for the pleasure of doing so, as could be assumed from the success of low cost flights.

The Schengen Agreement is a reality, but it is also an expectation, at least for those European countries that are not yet members of the EU but which aspire to become so. Schengen equates to a border, a limit to mobility, which during the course of the last few years has shifted several times, overlapping the pre-existing national borders in different ways.

An example can be represented by the Interreg programme for the Central Adriatic Danubian South-Eastern European Space (CADSES) which comprises 18 countries and it is contained between the Baltic Sea and the Mediterranean and spans the borders between the 15 member states of the EU and the countries of the first (2004) and second enlargement, and those countries for which it is not known if and when they will join the EU. CADSES is therefore a region of borders, borders which are in constant reorganisation. They changed following the First World War, between the First and Second World Wars and then again after the Second World

War. A new radical change occurred from 1989, with the end of the Soviet regime. Since this period, there have been constant expectations of subsequent border changes, the first confirmation of which was seen in 2004 when Poland, the Czech Republic, Slovakia and Hungary became members of the EU. During this phase, borders became instruments of acceleration, deceleration and at times even blockage of human mobility flows due to the introduction of the Schengen Agreement. If there is a subject that the Interreg programme CADSES should take into consideration more than any other, it is precisely that of human mobility which will certainly play an important role in the urban and regional restructuring of those 18 countries straddling several borders which are developing between the Baltic Sea and the Mediterranean.

Numerous changes have also occurred in recent years in the forms of production and consumption, which resulted in changes in migration and tourism and in the relationships between these. The relative scarcity of research in this subject, despite the huge significance of the phenomenon from an economic and social viewpoint, is justified by the lack of adequate and comparable statistical data. Only official and permanent flows are registered in primary statistics. For the rest, statistical information is either inexistent or suggests unreliable superimpositions between tourist flow and traditional migratory flow due to the necessity, or convenience, for each emigrant to register in the Municipality of temporary residence. Almost all the scientific work carried out on this subject points out the need to gather primary statistical data in order to improve the possibility of better understanding the phenomenon and thereby managing it in a more rational way. A phenomenon that is not quantifiable via statistical data does not even attract interest as a subject to be studied or researched, and therefore ends up being ignored by European institutions which do not stimulate the attention of administrations and politicians, thus contributing to perpetuating ignorance.

Push-Pull Processes and Human Mobility

This methodological reflection has been inspired by the scientific contributions of various social science disciplines since the end of the Nineties. Until then, the literature had actually referred to the "push-pull" concept (Dorigo and Tobler, 1983; Claval, 2002). This was based on the experiences of migration in industrial society which included above all individuals who moved from areas which provided few job opportunities to areas offering greater work possibilities, in relation to geographical, economic and social advantages and prospects. Migration is a global phenomenon which concerns the complexity of countries and world populations, despite the fact that for a while now there has existed a recommendation by the United Nations which defines the criteria for identifying the "immigrant situation" both from a statistical and normative point of view. In truth, this definition cannot be interpreted unequivocally in all countries of the world, especially because it needs to be constantly adapted to the evolution of the phenomenon and to the characteristics the latter assumes in the various economic and geographical contexts. In Italy, for example, the definition of immigrant is applied to individuals who are not in possession of Italian citizenship. This definition of immigrants includes also people from other EU member states who cannot be classified as tourists, businessmen/women, people in transit, personnel with diplomatic passports or members of the armed forces of allied countries. Figure 1 shows a model of mobility which presupposes a departure, or sending, country and an arrival, or receiving, country. Migratory flows move along this main line and it can occur that

at the end of working life a second flow is activated in the opposite direction, i.e. a return flow towards the departure countries. The study of the dimensions and characteristics of population mobility can occur at a general level, as an analysis of the flow. At a territorial level, the types of impact certainly change but the flow does not. Therefore, this can be studied effectively by using internationally-agreed parameters and thus on the basis of statistics drawn from each country (Montanari and Cortese, 1993).

Figure 1: the modern world society and the push-pull theory

Human mobility

In post-industrial society, work or recreational mobility tends to assume more subtle differences as occurs with places of work, free-time, recreation, training and education. The propensity to emigrate, which until now was based on decisions made by single individuals, is today considered to depend also on the characteristics and culture of the families and communities of origin. Furthermore, with the end of the Cold War, and with the efforts made to establish a "new world order", the mobility of individuals in a communication and information society has taken on a new dimension, significance, and also a new role in global policy, beyond the limits of country grouping. It is therefore necessary to extend the focus on traditional population flows and to consider new forms of mobility relative to the migration of workers employed in new types of production, economic globalisation, recreation, tourism and the internationalization of consumption. In the case of tourism, the decline in mass phenomena also provides a clear indication of the trend towards post-Fordist consumption, that is to say, towards more differentiated and fragmented characteristics of mobility. Mobility is the result of the behaviour of individuals who move across the territory in order to meet needs and desires connected to work and survival and, in modern society, also to those activities relating to free-time. In short, mobility phenomena differ according to space, time, economic motives and regulatory procedures. Distance can be characterised in various ways although whether a border is crossed or not can be a discriminating element and it is advisable to consider the crossing of an internal, municipal or regional border with just as much attention as an international border. Moves can be more regular or less so, but in the latter case it is necessary to know whether the length of stay is short-term, medium-term or permanent.

Mobility can be activated in various ways:

a) For economic reasons: to find work, but also to change jobs with the aim of social and professional advancement;

b) For social and demographic reasons: to form or modify the family structure; because of marriage or divorce; because of a reduction in size of the family nucleus due to the children coming of age; to have a more pleasant retirement, owing to the progressive ageing and improved health of the population;
c) For residential reasons: to have a home which is more comfortable and better linked to the workplace, where taxes are lower, or one which is less expensive with the same benefits;
d) For social reasons linked to quality of life: to live in areas that are more comfortable with respect to the location of the workplace, or better from the point of view of services and infrastructures; to seek out lower levels of air and noise pollution; to find an environment which is better suited to raising children;
e) For educational reasons: for motives of study; to attend university courses or to embark on traineeships;
f) As a result of the consequences of natural events or disasters: the damage caused by long periods of drought; acute and persistent food shortages; the construction of extensive public works, such as dams and arterial roads, which change the layout of the territory;
g) For reasons linked to political, military and religious events and persecution;
h) For work demands: individuals who work in sectors which require frequent travel either because of the operational needs of multinationals or because they operate in various parts of the world;
i) For tourism, recreation and free-time: for activities in constant qualitative evolution which attract increasing numbers of people.

Placing travellers who move because of strong economic, social, political and religious pressures, and who therefore live in a state of oppression, in the same category as those who move purely for pleasure can result in embarrassing misinterpretations. But it is true that the poor and the oppressed travel just as much as the rich and privileged, although the former obviously do not travel in business class nor do they stay in luxury hotels. However, they certainly do not travel more exclusively as emigrants, perceived from the country of departure, or as immigrants, seen from the country of arrival. These days, the term immigrant implies individuals that are less and less willing to integrate economically, socially and culturally in the countries they go to in search of work and safety, as occurred until the Seventies. Today, because of the evolutionary complexity of the economic system, there is a continuous increase in the number of individuals who make the journey and their state of mind is frequently assembled to that of the transhumant. These are men and women, therefore, who are set in their own ideas and attached to their own cultures, proud to be different amongst the different, who do not move towards a final point of arrival, but rather towards an intermediate stage which will be followed by another. They do not require integration in the receiving society but rather the acknowledgment of their rights, which must be valid and recognised at a global level, and of their own needs, in relation to the society which receives them. In this context, there no longer exist definite places of departure and arrival, but a series of places which are simultaneously places of departure and arrival, with flows which concern both consumption and production activities. Therefore, studies are hindered by the difficulty in correctly detecting and

studying the phenomenon at a general level. It is easier to analyse the phenomenon on a local scale. Each territory is capable of activating original mobility processes with characteristics and implications which do not occur in the same way elsewhere. If each place is a separate case then at an international level general qualitative conditions can be indicated, but certainly not a precise correspondence of quantitative definitions and characteristics. The local level and the territory become the favoured parameters for the observation of flows. Indeed, at this level it can be better assessed to what extent the economic development of a location determines the activation of population flows, whether temporary or definitive, and vice versa, that is, to what degree these flows contribute to development in its various stages.

Global change and human mobility, the Globility IGU Commission

Based on the methodological premise of a process of evolution of population flows, a Commission on "Global Change and Human Mobility (Globility)" (http://www.bun.kyoto-u.jp/geo/globility) was set up within the International Geographical Union (IGU) for the period 2000-2004, which was then renewed for the period 2004-2008[1].

The research carried out and the reflections made within the context of Globility have been published in Montanari (2002), Ishikawa and Montanari (2003), Vandermotten, Van Hamme, Medina Lockhart and Wayens (2004) and Montanari and Salvà-Tomas (2005). Many other articles have been published in national and international scientific journals.

Salient insights or conclusions from the Globility publications can be summarised in the following points:

- the contributions included in the first publications concerned human mobility not only in European countries, but also in other regions/countries, North America, Asian/Pacific and Africa;
- complicated patterns of human mobility in "new periods", chiefly since the 1990s, are explored minutely and convincingly. Specifically, the term "new period" here relates, for example, to the post-socialist and post-Apartheid eras. Although these "new" situations are indicative of the increasing exposure of human flows to global change in certain countries, the mechanisms and patterns have, as yet, only been partially clarified;
- various aspects of human mobility are examined. The contributions deal, not only with internal and international migration and unskilled migration, which have been male-dominant and which have attracted much attention in previous literature, but also with female skilled migration, which has generally been neglected. Attention was not restricted to only a particular type of human mobility, because individual types are closely related each other. It is a main purpose of Globility to throw light on diversity of human mobility in modern world.

[1] Researchers and academics from more than one hundred institutes, 50 percent of which are European and the remainder from all the other continents, joined Globility. During the period 2000-2004, Globility organized meetings in various countries: Italy (2001), USA (2002), South Africa (2002), Mongolia (2002), Spain (2003), UK (2003 and 2004), Italy (2005).

- some of the contributions focused not only of current human mobility in various parts of the world, but also on investigations of policy impact and policy-making. This point of view is no doubt essential for alleviating many inequalities through the world.

Of the four above-mentioned points, the first is perhaps the most significant in Ishikawa and Montanari (2003) and probably came about from moving the conference venues to different global locations and thus physically as well as theoretically moving away from a Eurocentric view of the issues of human mobility. The second, third and fourth significance is shared by the contributions of Montanari (2002), Vandermotten et al. (2004), and in the special issue of the Belgeo (Montanari and Salvà Tomas, 2005).

Globility has studied the forms of international migration and mobility which are associated with the processes of internationalisation and economic globalisation, the forms of investment and local development, and the social and cultural customs which concern prevalently consumption rather than production phenomena, and are therefore associated with new forms of investment and social habits.

The types referred to are:

a) the new forms of recreation, free-time and tourism which represent the economic preconditions for the transformation of urban areas. The economic restructuring brought about by the slump in traditional productive sectors includes forms of niche tourism which constitute the driving sectors in strategies of urban and regional development and restructuring;
b) the internationalisation of economic activities leads to new forms of short-term labour mobility, amongst which the temporary transfer between offices of the same multinational, and the participation in training, promotional and conference activities. This fosters investment in the hospitality and recreation sectors, and in the associated services and infrastructures, and therefore contributes to urban and regional restructuring;
c) changes in the timeframes, organisation and flexibility of work activities, in the availability of retirement income and in the organisational and institutional structure of pensions promote the processes pertaining to the internationalisation of recreational and retirement consumption;

The transition from a mobility caused by push-pull factors relating to productive activities, to a mobility triggered by prevalently consumption activities, concerns the whole world, insofar as the origin and destination of flows, according to a process which has assumed ever-increasing quantitative dimensions although these are difficult to identify with the instruments currently available. Human mobility is a new concept, one which has not yet been well defined and which is therefore difficult to classify with rigid forms of observation and recording which refer to minimum or maximum stays and to the crossing of spaces which have been traditionally classified. The significant increase in migratory flows can be schematically associated with a series of events, amongst which:

a) the intense population growth in developing countries, and therefore the abundant supply of manpower unable to find employment in the countries of origin. This population growth is unbalanced with respect to that of developed countries where growth is considerably lower and where there is insufficient manpower;

b) economic growth taxes which have amplified the differences in development between northern and southern countries;
c) technological innovations, especially in the transport and communications sectors, which enable long-distance travel at low cost and the possibility of keeping in contact with the countries and communities of origin;
d) systems of mass communication which have reached every corner of the globe and which permit a better understanding of the economic conditions and quality of life of other countries.

Migratory flows, which are increasingly conditioned by global communication and therefore by international economic and political events, are becoming more volatile and difficult to predict in the medium and long-term. In consideration of these assumptions, Globility has sought to answer the following questions:

a) what are the necessary conditions for a change in the dimensions and characteristics of international mobility? Is there sufficient empirical evidence of this change?
b) is there an indication of the need for a new dialectic between the global and local dimensions? Is it possible to create a model to interpret how human mobility constitutes an element of connection between the local and global dimensions?
c) what are the implications of the new forms of mobility? What are their causes and effects?
d) what are the characteristics and dimensions of the changes relating to mobility?
e) what are the interactions between the forms of mobility identified? Is it possible to identify a new theory of human mobility? Can a satisfactory empirical analysis be conducted on the basis of this new theorisation?

Interregional migrations in Europe: contribution of geography.
The European MIRE Research Project and the Espon Programme, Action 1.1.4
Together with a group of young researchers from the University of Brussels (ULB), Vandermotten prepared the "Interregional migrations in Europe (MIRE)" research project, to which research groups from the Universities of Copenhagen, Duisburg, Madrid, Newcastle, Chieti-Pescara and Vienna contributed[2]. MIRE took into consideration the migrations in the fifteen countries which were members of the EU in 2001. The statistical data on migrations was not available for such an extensive comparative analysis and therefore the figures were calculated by interpreting the existing demographic statistics in an innovative way. By definition, if the concept of a phenomenon does not exist, neither can the statistical data describing it, on a national and European scale, and therefore it is impossible to quantify the flows of human mobility that relate to Europe. For this project, a minimum number of national research groups was solicited, one for each country, which would be capable of representing and interpreting the phenomena occurring in the entire EU. The project identified the main migratory flows involving the European countries, the majority of which were at a NUTS 3 level (which corresponds to the French *départements*, the Italian *province*, and the English counties), since the Sixties. The whole thing was depicted using a series of maps of Europe, the most significant of which were those relating to the Nineties. The migration balance in

[2] The research project proposal was presented to the European Commission's Directorate-General for Employment and Social Affairs and was subsequently approved and funded (research VS/2001/0247).

the Nineties, that is, the decade in which great transformations occurred both within and at the borders of the EU. The 1990s saw a confirmation throughout the EU of that right to mobility which had already been established during earlier decades within the individual member countries. The right to mobility is therefore a right to settle freely in any country or region of the EU both for motives of recreation and work. But it is also the right to move to the urban peripheries and thus to contribute to those phenomena of housing deconcentration, based on the use of individual means of transport, which were then largely responsible for the deterioration in the quality of life and the environment. The right to mobility has also been expressed in the right to own a second home to be used for work, recreation and perhaps even to educate children in another region either in the country of origin or any other country in the EU. Whereas human mobility was a right accorded to the citizens of the EU in the Nineties, this same human mobility constituted a problem for those from countries outside the EU, for workers, refugees and illegal immigrants.

There were two sides to the 1990s: the beginning of the decade was considerably different to the end. (Vandermotten et al., 2004). As mentioned, the lack of statistical data for the comparative analysis allowed only the study of migration balances and not that of migratory flows. Therefore, use was made of in-depth analyses of human mobility in certain specific urban areas or regions symbolising each country's economic and social situation.

If, for example, the settlement areas of the African communities in European cities are examined, a common pattern becomes evident. This is connected to work activities, the level of integration and the duration of the settlement, even though, as White (1999) warns, the situation changes from city to city depending on the different economic situations, the attitudes of the receiving society, the culture of the migrating community and the geography of the housing market. The existing evidences, although not including illegal, underground, and temporary non registered immigrants, confirm the role of human mobility in shaping the future of European cities.

The results of the MIRE project have led us to conclude the following (Vandermotten et al., 2004):

a) Contrary to what some security or extreme-right discourses could suggest, there is no "invasion" of the EU by a so-called external immigration. Migration flows to the EU remain relatively inferior to those towards the United States. Flows from central-eastern and eastern Europe in particular have rapidly decreased since the initial wave in the early 1990s;
b) Meanwhile, it is true that, contrary to a multi-secular trend, the EU territory has turned into a land of immigration, also in peripheral countries which used to produce considerable emigration flows. Such immigration appears increasingly necessary to compensate for the consequences of the aging European population and, from this point of view, is even insufficient;
c) Nevertheless, the logics of intra-national moves continue to dominate the population flows very strongly. They show relatively stable geographical trends in the exchanges between macro-areas. Mobility between the EU countries remains weak. The intra-national logic appears even more significant if one considers the continuing trend toward peri-urbanization, if not toward counter-urbanization;

d) The phenomena of mass rural exodus belong to the past. There is now a demographic revival in large parts of the rural and semi-rural interstitial spaces of central EU zones, and even in some more peripheral rural areas, with the notable exception of the Scandinavian periphery;
e) An increasing percentage of population flows is no longer directly linked to the state of the labour market or at least is no longer rationally linked to the objective situation of this market in immigration areas;
f) Environmental factors determine a growing part of population flows on different scales. As well as influencing the location of some enterprises, they are also likely to generate new economic dynamics by themselves.

The European Spatial Planning Observation Network (ESPON) promoted Action 1.1.4 "the spatial effects of demographic trends and migration"[3]. The research is structured around a series of research fields which include methodological analysis, the natural changes in the population and the processes of ageing, migrations within the individual European countries and between them, fertility rates, migrations and depopulation, ageing, labour shortage and "replacement migration".

The spatial impact of human mobility
The changes brought about by human mobility, as identified by the above mentioned research projects, can have various spatial implications:

a) Implications of an economic nature: changes in human mobility affect the redistribution of expenditure and the reorganisation of investment. This causes processes of urban and regional restructuring both in countries of immigration and emigration;
b) Implications of a social and demographic nature: the new flows of human mobility have an impact on the labour and property markets. They also contribute towards changing welfare policies for pensioners and the unemployed, in the same way as the ageing of the population contributes towards replacement migration;
c) Implications of a political nature: the new forms of mobility, considered unexpected and unpredictable, modify the parameters of partnership and governance. Indeed, the parameters of the receiving community change, because diverse components are added which in certain quantitative and qualitative conditions can result in manifestations of xenophobia. The political influence can also exist in the case of virtual mobility, used as an element of real or imagined pressure, both for internal politics and as political instruments used in relations between the States;
d) Implications of an environmental nature. As present-day mobility is not easily identifiable in statistical terms it does not allow an evaluation of its incidence because it is temporary, unregulated or casual and in any case concentrated in time and space. This places a burden on the quality of the water, air, landscape and waste management, and generally creates the conditions for rivalry between regular and casual residents in the use of resources;

[3] The project was assigned following a call for tender to a group coordinated by the Swedish Institute for Growth Policy Studies (ITPS), Stockholm, composed of research groups from the University of Lisbon, the University of Vienna, the Université Libre de Bruxelles (ULB), the G. d'Annunzio University in Pescara, the Norwegian Institute for Urban and Regional Research (NIBR) in Oslo, and the Hungarian Public Non-Profit Company for Regional Development and Town Planning (VATI) in Budapest

e) Implications of a cultural nature: mobility brings about cultural change for both the receiving society and the immigrant society, which is not always welcomed and which always manifests an innovative cultural demand. Although integration policies are not always desirable, the meeting of communities of different cultures still contributes to changes in the cultural identity of all the communities which come together or clash.

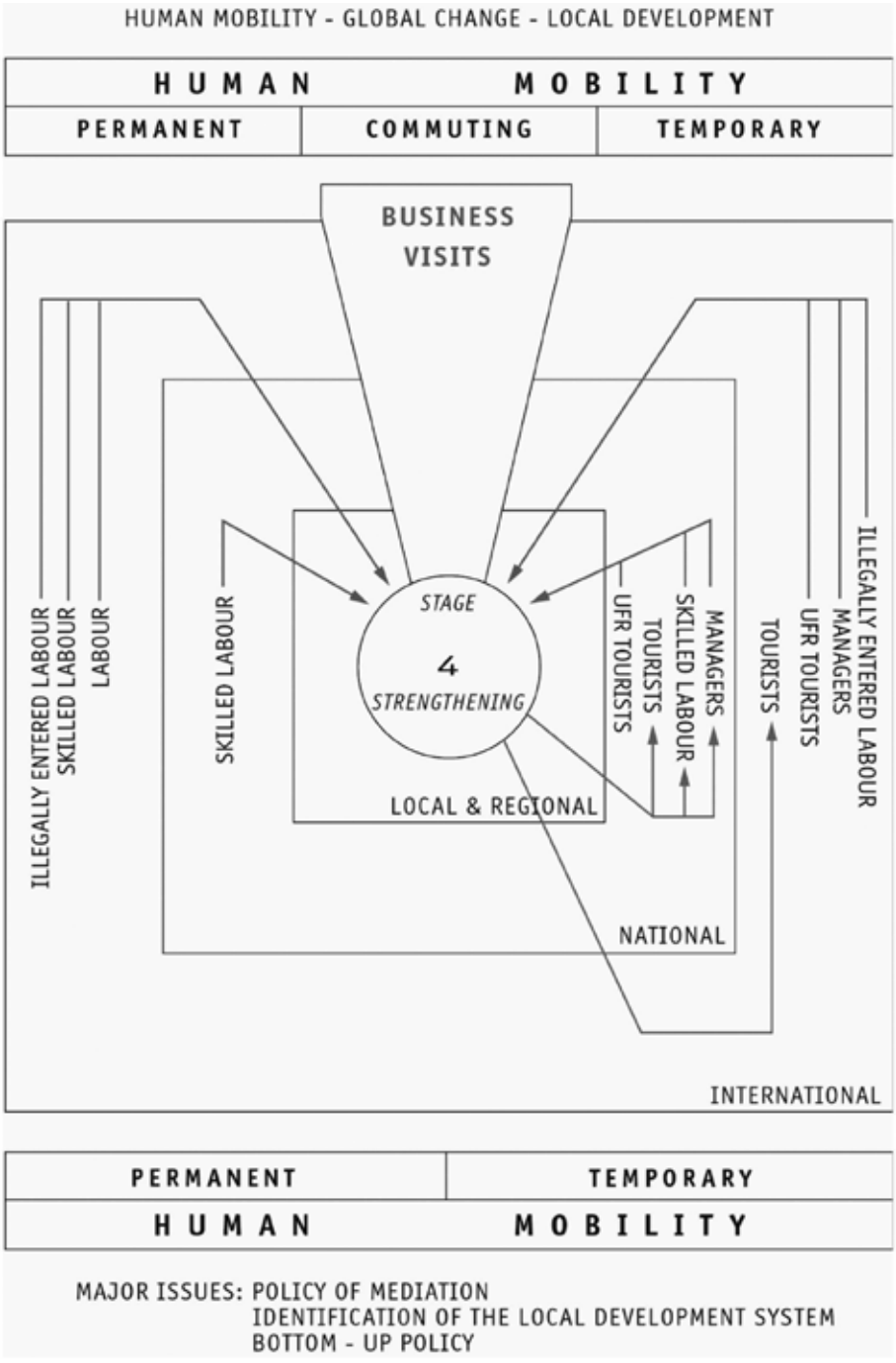

Figure 3: Human mobility – global change – local development

Empirical evidence of a connection between stages of development and human mobility flows, amongst others, was revealed in the research carried out on the Balearic Islands by Salvá-Tomás (2002). This scholar identifies seven stages of economic development which refer to as many stages of growth, crisis and consolidation of the tourist sector. To each of these phases which identify different flows of human mobility prevalently aimed at consumption, it is possible to link as many stages in which mobility flows are instead geared towards production. Flows coming from European countries are prevalently attracted by consumption activities such as tourism and recreation, long-term tourism, second-home ownership, and long-term stays during retirement. Also linked to these flows are those in connection with productive activities linked to tourism, holidays and recreation, or to professional services in the fields of property or finance consultancy or health care. The age pyramid of residents from Germany, for example, is characterised by the majority presence of individuals in the 50-64 age-group, with a significant presence also for the 30-50 age-group and a general prevalence of females. Flows from developing countries, on the other hand, tend to be attracted by production activities, although these too contribute towards activating other, minority, flows, linked to consumption and therefore to visits from relatives and friends and to family reunions in general. In the case of residents from African countries, the age pyramid reveals a prevalence of individuals from the 30-40 age-group and a presence of males three to four times higher than that of females. A similar study was carried out in the Valle del Sangro with the analysis of international migratory flows in relation to the economic stages of development activated by the setting up of the "Consortium for the development of the Sangro-Aventino industrial area" (Staniscia, 2005). In outlining the conclusions of her study, B. Staniscia (2005) refers to a model of migratory pull based on two main characteristics: the local economy, capable of offering work opportunities for unskilled personnel and for managers and entrepreneurs; and the very hospitable local community, which is therefore able to accommodate migratory flows – not necessarily legal – coming from Mediterranean countries.

The connection between stages of local development and the different types of human mobility was summed up in a recent study (Montanari, 2005). In this study, mobility flows were classed according to three spatial levels – local, national and European, and international – and three types of mobility – commuting, temporary and permanent. According to these characteristics, flows were separated into outflows and inflows. By way of example, Figure 3 indicates the stage of development that relates to the strengthening of the productive sector. In this stage, the inflows are still prevalent as can be seen in the red colours of the vectors. In a subsequent stage characterised by the introduction of information and communication technologies and services for the productive sector, inflows and outflows are more balanced from a quantitative point of view, whereas there is the need for a greater attraction capacity in qualitative terms.

Conclusions

Due to their complex nature, projects founded on international cooperation require lengthy methodological preparation, the study of other works carried out in this field on an international scale, the choice of partners capable of representing the different schools of thought and at the same time able to collaborate in the face of differences in culture, religion, race and schools of thought. A multinational research project has many possibilities of success if it has high-profile scholars on

board, but it will multiply those chances if it is able to establish a relationship of mutual understanding and possibly mutual respect.

The changes illustrated have been confirmed by the projects mentioned here, which represent some of the main international researches that has been carried out during the last few decades on the issues of urban and regional restructuring and human flows.

The aim of research should always be very ambitious and should foresee the application of new models of assessment and the creation of scenarios in a position to outline policies and provide decision support systems. Furthermore, reflections should be made on the possible creation of policies equipped to manage human mobility, in terms of the qualitative and quantitative control of flows. The distribution of the effects of mobility on the territory is always extremely varied and as a consequence there is a difference, in relation to localization, in the perceived costs and benefits of mobility and thus in the policies proposed.

In Europe major trends can be summarised as follow: (i) the European Union (EU) has become entirely attractive, even countries of traditional emigration as Greece, Ireland, Italy, Portugal and Spain; (ii) metropolitan areas is where human mobility is concentrated. The phenomenon can be justified by the relevance and diversity of the employment market, the supply of cultural and social events, and the presence of different communities of immigrants; (iii) in the new EU member countries emigration flows lowered in general and differences can be registered according to the economic situation; (iv) human mobility is also growing in southern coastal regions including retired people from the North and manpower from Africa and Latin America.

The groups that come out better or worse from the impacts of mobility do not belong to necessarily defined categories; indeed, they can vary according to economic growth, migratory rate, and the capacity of new arrivals to cohabit with the receiving communities. Some people suggest that good neighbourliness is built upon an efficient system of border control, but in the present international situation, the differences are too extensive not to allow a continual migratory flow, rather than thinking of building barriers. However, this imposes unequal costs and advantages on the territory which are not sufficiently considered in terms of planning and can therefore contribute in creating tension and even new forms of xenophobia. In the current global climate there is the risk that current human mobility might have played an important role in exacerbating rather than improving "disequilibrium" between, for example, the North and the South, or the West and the East. The answer to this challenge cannot remain with the control of international flows which certainly will become even more difficult on a long-term basis because of the development of new forms of social networks. More than ever social scientists need to continue in their strong endeavours to examine how they can contribute to realisations of "equilibrium" by investigating human mobility in the contemporary world.

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AS FOR THE FUTURE ...

by Jacques Robert

Jacques Robert has devoted 30 years of his professional life to European issues of regional and territorial development. Between 1985 and 1994, he has been director of the European Centre for Regional Development in Strasbourg. Since 1995, he is leading a consultancy office (TERSYN) which carries out numerous research, cooperation and assessment projects at the request of European, national and regional institutions in Europe. He has been the leading expert in the drafting of the Europe 2000+ Report of the European Commission. He is also adviser of CEMAT at the Council of Europe and has drafted the "Guiding Principles for the Sustainable Territorial Development of the European Continent". In the context of the ESPON Project 3.2., he is coordinating the elaboration of the spatial scenarios.

In this paper Jacques Robert explains the way ESPON is looking at the future. The purpose of this exercise developed within the ESPON project 3.2 in strong cooperation with policy makers (ESPON Monitoring Committee) is to investigate if and under which conditions the objectives of the ESDP can be achieved in the long range. The scenarios elaborated enable to explore the future evolution of European regions and the overall spatial structure of the ESPON space, considering the most important policy options for Europe: competitiveness and cohesion. The author gives us some insights on how these objectives can go together.

The way ESPON looks at the future

Looking at the future is not, by far, the main objective of the ESPON Programme which is oriented towards improving the understanding of the diversity of the European territory and of territorial development, of the enhancement of the spatial dimension of the structural funds, cohesion policy and other Community policies and towards the elaboration of proposals for a better application of the ESDP and for an improved coordination of territorially relevant policies.

The objectives of the ESPON Programme indicate however explicitly that the improvement of the understanding of the diversity of the European territory and of territorial development should include the prospective dimension. It is therefore justified to investigate which contributions the ESPON Programme has so far devoted to future-oriented analyses and projections as well as to foresight studies and scenarios.

The ESPON project 3.2. was asked to "make use of results and data sets elaborated by the on-going ESPON projects" and to "explore the major driving forces, based on the results from the other ESPON projects". However, in reality, the contribution of other ESPON projects to the elaboration of scenarios under Project 3.2. is rather limited in terms of practical utilisation and a lot of additional knowledge had to be collected and analysed before the elaboration of integrated scenarios could start.

ESPON Project 3.2. has a special position in the context of the whole ESPON Programme, being mainly devoted to foresight research. Although the other ESPON studies are likely to deliver a number of outputs which can be considered by Project 3.2., not only the methods of Project 3.2. are rather different from those of the other project, but also the information base (own research on drivers of territorial development) and the relationships with policy decisions and monitoring (elaboration of policy scenarios and close cooperation with the Monitoring Committee of the ESPON Programme).

Why spatial scenarios? Territorial development is related to long-term evolution. Debates on territorial development seem abstract and require tools of communication. Territorial development is interdisciplinary by nature. Territorial policy-

making needs information on possible long-term evolutions, spatial consequences and inter-relationships between sectors and actors. Spatial scenarios offer visions of possible futures, concrete images and explanations of trajectories and are therefore an appropriate tool for fulfilling these needs.

The approach adopted in ESPON Project 3.2. - "Spatial scenarios and orientations in relation to the ESDP and cohesion policy"

The approach chosen by the project team and approved by the ESPON Monitoring Committee (policy stakeholders) allows integrating quantitative data, qualitative aspects of spatial development considering the achievements of different ESPON projects, such as quantitative models and data, and policy options and goals.

The combination of quantitative and qualitative approaches is a peculiarity of the method adopted. Territorial scenarios are by nature long-term exercises of foresight research and have to combine a large variety of thematic considerations and speculations which are mainly of qualitative nature. It is however clear that quantitative and model-based projections can bring valuable information about the size of evolution ranges and about the differences in the outputs of the different scenarios. This is why various models and innovative quantitative approaches were developed and used in the elaboration of the scenarios. These are mainly:

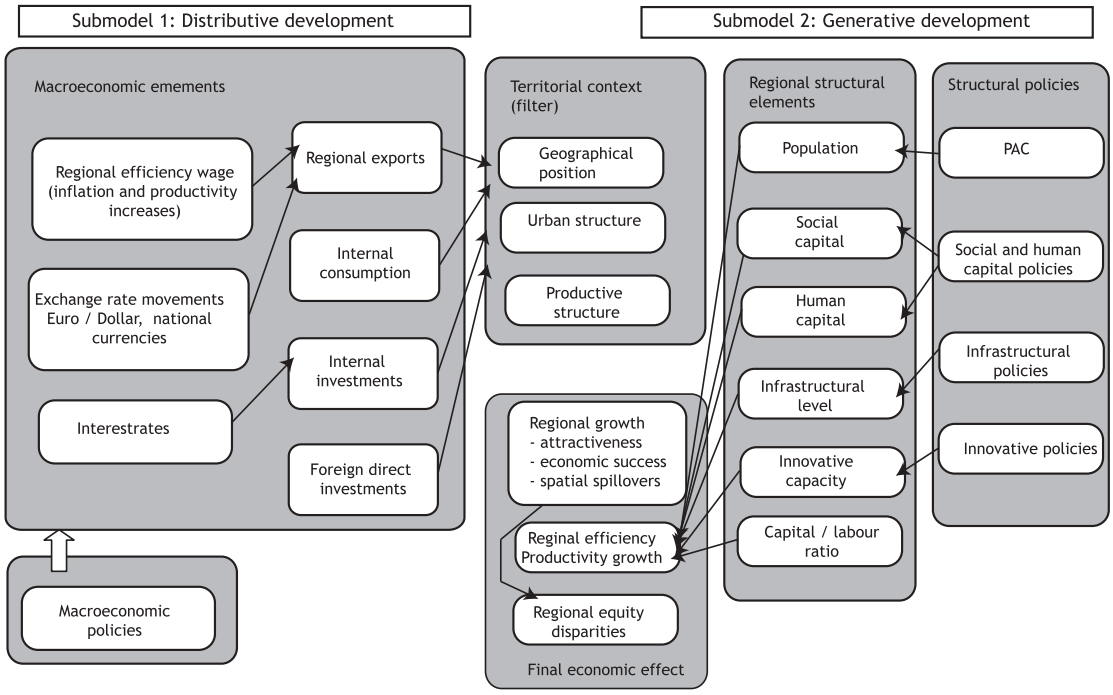


Figure 1: Distributive and generative development

- The calculation of a regional index of sustainable demographic development for 2030, combining life expectancy and median age of the regional population;
- The MASST model (Macroeconomic, Sectoral, Social and Territorial model) is an econometric model to measure determinants of regional development and imbalances (regional = national component + regional component). It takes

into account macroeconomic, technological, institutional, demographic and socio-cultural driving forces and uses hypotheses from the integrated scenarios;

- The KTEN model is a metamodel of inter-regional passenger and freight trips (policy-support expert system based on existing transport models). It uses hypotheses from integrated scenarios.

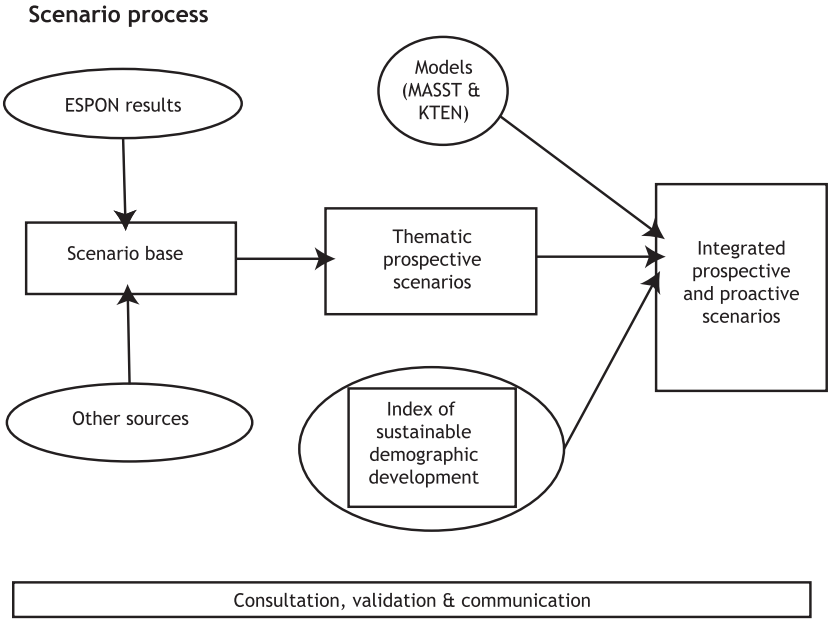


Figure2: Scenario process

The elaboration of scenarios took place in two phases:

Phase 1: Thematic scenarios

First, a series of thematic scenarios were elaborated with a main didactic character. Their function is awareness raising. The themes considered were: demography, socio-cultural evolution, transport, energy, economy, rural development (CAP reforms), climate change, territorial governance, EU enlargements. For each theme quite opposite scenario hypotheses (rather extreme but not unrealistic) were chosen. The scenarios were mainly qualitative. For each scenario, following information was provided: hypotheses, main evolutions, image of the European territory by 2030. The thematic scenarios highlight the territorial impacts of exogenous factors taken individually.

For each theme, a so-called "scenario base" has been elaborated, the purpose of which is to gather all the knowledge and information necessary to anticipate future evolutions. It comprises thematic information on the present situation, trends and available forecasts, main driving forces and EU policies related to the theme (and their evolutions). Even though these thematic bases and scenarios feed into the integrated scenarios, they stand on their own and can provide very important inspiration to policy makers. The bases are an important source of information for someone looking for a quick overview of the most important drivers and trends in a specific field and in relation to territorial development.

Phase 2: Integrated scenarios

Considering the roll-forward scenarios, in order to explore the future evolutions of European regions and the overall spatial structure of the ESPON space, the project team, in collaboration with the ESPON Monitoring Committee, decided to elaborate three roll-forward scenarios, one baseline and two prospective policy scenarios (cohesion scenario and competitiveness scenario). The latter were defined using two 'axes' of policy making, not necessarily opposing each other, but implying different priorities on one axis policy choices are lead by the desire for cohesion, on the other axis they are determined by the desire for competitiveness, including of Europe as a whole. In the final stage, a roll-back policy scenario has been elaborated which attempts at combining the most positive territorial impacts and evolutions of the two roll-forward policy scenarios and to investigate the possible policy priorities and actions required to achieve it.

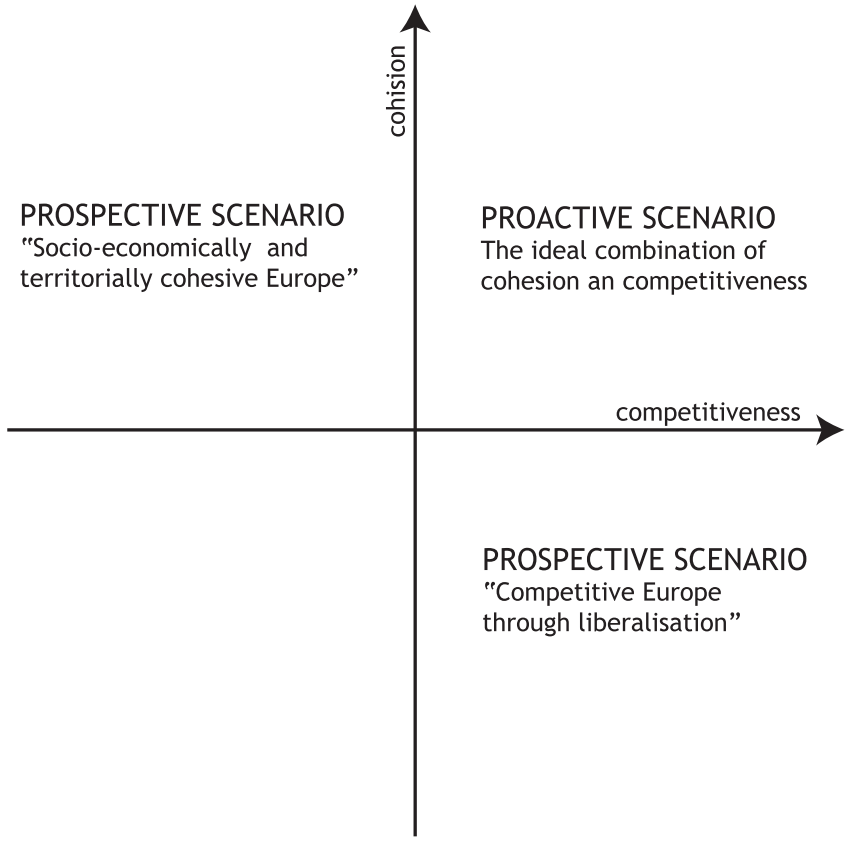


Figure 3: The axes defining the integrated prospective policy scenarios

For the roll-forward scenarios, the hypotheses for the scenarios were elaborated in close collaboration with the ESPON Monitoring Committee, in order to reflect some of the important questions raised in current policy debate. The scenarios have deliberately been chosen to be quite contrasted, each representing quite opposite policy options. They should also be seen as pedagogical exercises aiming at raising the awareness of policy makers and other stakeholders concerning possible evolutions. The Table below presents the hypothesis that came out from the a participatory process involving the research group, the ESPON Monitoring Committee and a regional validation exercise carried out during the ESPON seminar in November 2005.

Taking into consideration the development of this ESPON project, special attention will be given along this paper to the integrated "baseline scenario" and the two prospective policy scenarios: "competitive Europe" and "cohesion Europe" (Figure 4).

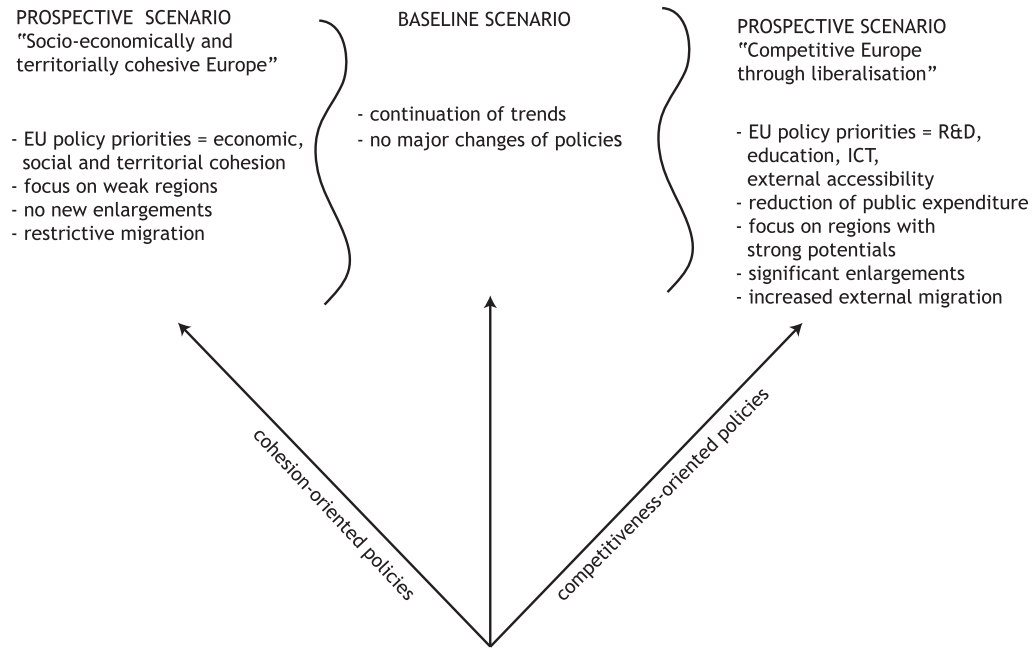


Figure 4: Main aspects of three scenarios developed in ESPON 3.2: Baseline scenario and the two prospective scenarios.

The integrated baseline scenario: territorial issues arising in 2030

By nature, a baseline scenario is based on a continuation of trends and the principle that no major changes occur in the policies applied. It is however important to consider that in certain fields, like demography, the evolution over previous decades (structural evolution of the European population, with decreasing fertility rates and mortality rates, leading to population ageing) is also valid for the coming decades, while in other fields (such as that of energy price), the recent evolution seems more relevant for the future, than the past evolution over a longer period. In addition, a baseline scenario has also to consider a number of policy measures adopted recently (such as the Kyoto agreement), even if the impacts of such measures are not yet well known. In other words, a baseline scenario is not identical to the extrapolation into the future of long-range past evolutions.

According to a baseline perspective, the characteristics of the European territory in 2030 reflect a number of important changes, compared with the situation in 2005. By 2030, the European population is, on average, much older than in 2005, with strong variations however, from region to region. The total population has declined, despite the existence of a new growth impetus in fertility rates evident in a number of countries after 2000. Areas with a particularly old population (average age above 50 years) are East-Germany, Northern Italy and Sardinia, Corsica, North-West Spain, Scotland, Northern Sweden and Central Greece. In the countries of Central and Eastern Europe, population ageing is counteracted by low life expectancy, despite very low fertility rates. In regions with very old population structures, a number of related impacts can be observed, such as the weakness of the labour

market which reduces the propensity of enterprises to invest and to create jobs, the slowing down of internal demand, the reduction of services of general interest caused by progressive population decline.

Baseline scenario	Competitive Europe	Cohesive Europe
Demography - Fertility down and mortality down => population ageing - Total European population stable (+ enlargement) - Increased, but globally controlled external migration - no change on constraints to internal migration	**Demography** - increase in selective (economic sectors & destination) external immigration - abolishment of constraints to internal migration - increase in retirement age - encouraging fertility rate through fiscal incentives	**Demography** - restrictive external migration policies - more flexible retirement ages - encouraging fertility rates (=> encourage better balance of population structure) - more flexible arrangements for child care
Economy - slowly increasing total activity rate - slowly growing R&D expenditure, but constant technological gap to USA - decrease of public expenditure	**Economy** - sustained increase of activity rate - flexibilisation of labour markets - stronger reduction of total public expenditure than in baseline scenario - further privatisation and liberalization of public services	**Economy** - increasing activity rate, in particular in peripheral regions - maintaining the volume of EU budget - reinforcement and strong focus of structural funds on weakest regions - further harmonization of taxation and social security systems
Energy - steady increase of energy prices - European consumption stable/decreasing - increase of the use of renewables	**Energy** - steady increase of energy prices - European consumption increasing - realisation of TEN – E: investment in infrastructure according to market demand	**Energy** - steady increase of energy prices - realisation of TEN-E - promotion of decentralised energy production (in particular renewables)
Transport - constant increase of infrastructure endowment - constant congestion levels - application of the Kyoto Agreement	**Transport** - realisation of TEN-T: investment in infrastructure according to market demand - priority to links between metropolitan areas	**Transport** - development of TEN-T with priority to peripheral regions at different scales - support to transport services in rural and less developed regions
Rural development - further liberalisation of international trade - progressive reduction of	**Rural development** - rapid and radical liberalisation of CAP (reduction of tariffs, of	**Rural development** - minor CAP reforms, but shift from pillar 1 to pillar 2.

CAP budget	budget and of export subsidies) - reduction of support to rural development policy	- priority to environmental and animal health criteria - active policy for diversification of rural areas, including SMEs, tourism, residential functions etc.
Socio-cultural sector - increasing polarization between socio-cultural groups - growing socio-cultural (ethnic, religious, and social) tensions	**Socio-cultural sector** - reactive management of social problems in large cities - increase of surveillance and security systems	**Socio-cultural sector** - promotion of regional and European identities - proactive socio-cultural integration policies, in particular in cities - increased fiscal and/or social investment in quality of life issues
Governance - increasing cooperation between cross-border regions - increase in multi-level and cross-sectoral approaches, but limited to specific programmes (rural development);	**Governance** - abolishing barriers to cross border cooperation - less public intervention - reinforcement of the Open Method of Coordination - increased role of private sector in decision making	**Governance** - active multi-level territorial governance, in particular in areas supported by structural funds - strong role of public actors in territorial governance - stronger role for the European Commission
Climate change - Moderate overall climate change until 2030 (+1°) - Increase of extreme local events - Constant emission levels - Few (too little) structural adaptation measures	**Climate change** - constant to increasing emission levels - mitigation measures based on flexible schemes & stimulation of alternative technologies. - adaptation measures only where cost efficient	**Climate change** - constant emission levels - strict mitigation measures (taxes, road pricing as far as non detrimental to peripheral regions) - wide range of adaptation measures (EU hazard funds, large investments)
Enlargement - by 2008 Bulgaria & Romania - by 2020 Western Balkans - by 2030 Turkey - continued combination of deepening and widening - modest impact of neighbourhood policy	**Enlargement** Continuing enlargement to widen the market: - Romania, Bulgaria 2008 - Western Balkan 2015 - Turkey 2020, possibly Ukraine - Strengthening of the neighbourhood policy (Maghreb, Russia etc.)	**Enlargement** - deepening preferred to widening - break on further enlargement (except Bulgaria & Romania, which enter later than foreseen) - only lip service to neighbourhood policy

Table 1: Hypotheses for the baseline and the two prospective scenarios

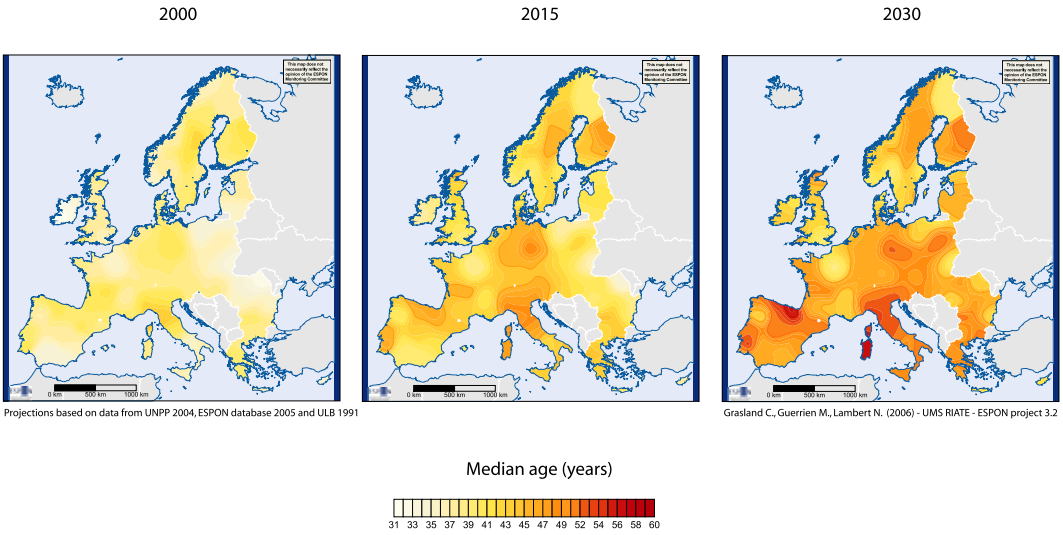


Figure 5: Baseline Scenario

Considering the cumulative growth of GDP between 2002 and 2015 (MASST model), the catching up process of the East-European economies is obvious with regional growth rates largely higher than in West-European regions (clear eastwards shift of the European barycentre of growth). Only a few East-European regions show a modest growth rate: those along an axis stretching from Sachsen towards western Slovakia (excepting the large metropolitan areas) and a few regions in Romania. Growth in particularly significant in the Baltic States, Poland, eastern Slovakia, western regions of Romania and Bulgaria and Cyprus in the eastern Mediterranean. In Western Europe, the development pattern is more diversified. One can observe a greater performance of the Eastern border regions in Western European (EU-15) countries, from Denmark to Germany and Austria, accompanied by a general slow-down in the growth of more peripheral countries and southern regions. While most regions of the pentagon show sustained, but not top economic development, especially those with large metropolitan areas such as London, Paris, Milan, Hamburg, Frankfurt, Düsseldorf, Stuttgart and Munich (exceptions are eastern France and some German regions), a number of regions surrounding the pentagon perform less favourably, such as those of central and western France, the "Third Italy", the Midlands, but others show stronger economic performances than most pentagon regions: the French southern belt, all Danish regions and a cluster with particularly strong growth along the Brenner axis, encompassing the Munich metropolitan region, western Austria and the eastern Alps in Italy. In the western periphery, higher or medium growth rates are observed in regions with metropolitan areas (Dublin region, central Scotland, metropolitan regions of Lisbon, Madrid, Rome Naples, Athens, Stockholm, southern Finland) and in some less urbanised regions (southern Ireland, northern Ireland, Wales, south-west Sweden), as well as in tourist islands (Balearic Islands, Rhodes, Crete). Large parts of the western periphery show however weak economic performances (most regions of the Iberian Peninsula, of the Nordic countries, of southern Italy and of Greece.

The result of three decades of moderate economic growth and of insufficient competitiveness in Europe in a context of accelerating globalisation is that a number of large European companies have been taken over by foreign multinationals from North America, Japan and emerging economies (Asia, Brazil). Strong restructuring and rationalisation has taken place in the related European branches.

Europe is leader in a few sectors, such as aeronautics, some new energy technologies and specific sectors of biotechnologies. Especially in the capital-intensive sectors of biotechnologies, energy and transport (railways in particular) a strong concentration of enterprises has taken place. A number of successful privatised ports were taken over by foreign companies, especially from the Middle-East. A few large energy companies control the production and distribution of electricity, the sectors of renewables (in particular the production and transformation of energy crops, the wind energy parks), the development, renewal, operation and maintenance of nuclear power plants, the distribution of natural gas, the coal gasification plants, the production and distribution of hydrogen. Service industries and advanced tertiary activities are much more developed than they were in the early 2000s, as are household related services. On the opposite, numerous industrial activities with low and medium technological level have disappeared from Europe, even from the countries of central and eastern Europe, for reasons of insufficient competitiveness. The same has happened to energy-intensive industrial activities, especially metal production, petrochemical and basic chemical activities. These trends, accompanied by asymetric shocks, have led to strong territorial differentiation and specialisation.

Considering the long-range economic trajectories of regions, the European territory of 2030 shows that sustained growth processes are specific to a few categories of areas, in particular those characterised by high-level metropolitan or gateway functions, those attractive for specific population groups such as retirees, tourists etc. or those with new, significant economic activities such as in the field of new energy technologies and renewable energy supply (production of biofuels in particular). The catching-up processes characterising less developed countries during the years following their accession to the EU, on the opposite, is valid only for the short and medium term (generally not more than 15 years). After that, significant processes of territorial differentiation take place, based more or less on the same principles as those prevailing in the more central areas, with on the one hand, metropolitan regions continuing above-average development and, on the other hand, rural and intermediate regions lagging behind in their development pace if they don't have specific advantages of attractiveness. By 2030, these types of long-range economic trajectories appear to be valid not only for the new member countries of central and eastern Europe, but also for a quite number of regions in the EU-15, in particular the peripheral ones.

The two prospective policy scenarios

Cohesive scenario

The scenario is a prospective, policy-oriented scenario in which the main priorities of public policies at EU level, in a context of growing globalisation, are focused on economic, social and territorial cohesion and not on global competitiveness. This does not mean that the improvement of competitiveness is excluded, but rather, that in case of incompatibility between cohesion and competitiveness (for instance if growing competitiveness is likely to increase territorial disparities), priority will be given to cohesion. It is however important to indicate that measures related to competitiveness in the context of structural policies are fully integrated in the scenario, even if they are likely to generate intra-regional disparities in less developed regions. It must be made clear that the scenario is a prospective policy scenario based on a strong cohesion policy and not a roll-back scenario minimizing regional disparities. Another major hypothesis is that the coming decades will be

devoted to consolidating the enlarged EU in a balanced and sustainable way. Only Romania and Bulgaria will join the EU during the study period, while the neighbourhood policy will be focused mainly on maintaining good relationships with immediate neighbour countries, quite independent of whether or not they are candidates to join the EU.

Maintaining and even strengthening EU cohesion policy is the result of both the EU enlargements of 2004 and subsequent ones embracing Romania and Bulgaria and of a reaction to the territorial imbalances generated by accelerating globalisation in the early 2000s. Preserving the vitality of less favoured regions appears as a fundamental long-term objective, because the economic and social costs of devitalised regions are, in the longterm, extremely high. On the other hand, this collective attitude does not ignore the requirements of competitiveness. The new cohesion policies include numerous measures aimed at increasing the competitiveness of less favoured regions and avoiding their marginalisation with regard to globalisation trends. As a renewed and strengthened cohesion policy is also more expensive, EU budgets have to be correspondingly increased and various resources diverted towards the cohesion policy. The CAP, transport and RDT policies are consequently being adapted to give priority support to less favoured regions.

A significant difference with the baseline scenario regarding the impacts of demographic evolution is the introduction of more flexibility in a number of public policies in order to facilitate all forms of cohesion. Flexibility in child-care arrangements and pension ages are becoming the norm. Confronting institutional forms of ageism and removing compulsory retirement ages is part of this process, although it is less popular among certain occupational groups though, particularly those involving physically demanding work. Flexibility is also extended to other aspects of life too, such as education, making family commitments more manageable. Allowances paid to grandparents and other older/retired relatives, instead of or as well as mothers are also becoming a widespread means of integrating the so-called third and fourth generations in community life and maintaining healthy life expectancy rates.

In global terms, the cohesive scenario is a less expansive scenario than the baseline scenario. A lower relative GDP growth rate is registered for the EU as a whole, but it is significantly lower for the EU15 countries than for the New 10 countries (as well as Bulgaria and Romania), although these countries show also a lower performance than in the baseline scenario. The difference is however more contained than in the EU15.

The lower performance registered at the aggregate level in the cohesive scenario with respect to the baseline scenario is not equally distributed at regional level. Some regions are in fact able to show greater GDP growth rate in the 2002-2015 period with respect to the baseline scenario. In particular, the following territorial trends emerge, compared with the baseline scenario:

- in general, the cohesive scenario provides *a more diffused development*, especially in more rural regions, in peripheral regions, and in regions with a medium-low income level;
- the *barycentre of growth moves towards South-Eastern Europe*, a tendency witnessed by a greater performance in Eastern Germany, Austria, Hungary, Greece, part of Central and Southern Italy;

- in general, *the periphery of Europe grows more than in the baseline scenario*; Greece, Sardinia and Corsica, most regions of Spain, Northern Ireland, the Northern part of the Irish Republic and all Scandinavian countries;
- interestingly enough, and contrary to some existing assumptions, *fragmentation of relative growth rates in Eastern European countries is limited*. First of all, despite the favouring assumptions, no category of regions perform much better than in the baseline scenario, with the exception of some Hungarian regions and the eastern regions of Poland. A relatively higher performance is registered in rural areas, while agglomerated and mega regions perform relatively less but still better than the western ones;
- *a more fragmented territorial picture characterises EU15 countries*, where the variance between lower and higher relative performance is more pronounced;
- *capital city regions in general lose their relative better position* obtained in the baseline scenario, in both Eastern and Western countries. This is true for Athens, Rome, Madrid, Paris, Brussels, Luxembourg, London, Copenhagen, Stockholm, Helsinki, Berlin, Vienna, Prague, Budapest, Bucharest and Sofia. *The relatively bad performance of capital cities is also registered for the "engines of Europe"*, like Milan, Barcelona, Frankfurt, Malmö, Munich, Stuttgart, Düsseldorf, Cologne;
- in Western countries, some *relatively better performing regions can be found also in peripheral areas and/or rural regions*, like Bretagne, Pays-de-la-Loire, Champagne-Ardenne and Languedoc-Roussillon in France, Toscana, Marche, Abruzzo, Calabria, Veneto and Friuli in Italy, East-Anglia, South-West, in UK, Northern Ireland, Schleswig-Holstein in Germany.

If the change in the relative position is taken into consideration, the previous tendencies are confirmed, namely:

- *in Eastern European countries the relative winning regions are the peripheral and more low-income regions*. The agglomerated and capital city regions are losers with respect to the baseline scenario;
- *in Western European countries, the winning regions are in general rural and peripheral areas, as well as the western border areas with the Eastern countries;*
- *some additional areas emerge as winners, especially in the Pentagon areas and in Central and Southern countries*, due to the relatively lower increase in population growth.

When looking at the per capita GDP level achieved in 2015 in the cohesive scenario some interesting trends emerge with respect to the baseline:

- *the relative effect of the cohesive scenario on the catching-up process of Eastern countries is a limited one*; only a few regions register in fact a greater per capita GDP level than in the baseline scenario, and this is especially true for the weakest and lowest level income regions. At the same time, the strong areas in Eastern countries have a lower per capita GDP level. This double trend reduces intra-national disparities but increases international disparities, as shown in;
- *in Western countries, a higher per capita GDP level is achieved in the periphery of Europe, in most remote areas with respect to the Pentagon*. The latter, on the contrary, is in general losing its per capita income level with respect to the baseline;

- *the areas registering the highest increase in per capita GDP with respect to the baseline* are regions belonging to central Europe (Eastern Germany, south-eastern Bavaria, Austria and Trentino and Süd Tirol in Italy) as well as most Swedish regions.

Compared with the baseline scenario, the demographic situation of Europe by 2030 is less declining thanks to a revival of fertility rates in various countries, however stronger in western than in eastern Europe. The median age of the European population by 2030 is therefore lower and the demographic potential higher than in the baseline scenario, as for instance in southern and north-western Spain and in southern Italy. In a number of areas, however, such as central Sweden, eastern Finland, northern and south-eastern Poland, southern Hungary, the demographic potential is lower than in the baseline scenario and population decline affects many eastern and some southern areas of Europe.

The impacts of the revival of birth rates on the labour markets are not yet significant by 2030. In order to compensate for the massive retirement of the "baby-boomers" and for stronger immigration control, retirement age was postponed, so that numerous people older than 65 are still at work by 2030. Population of immigrant origin living in Europe (second and third generation) is however better integrated in the labour market than in the baseline scenario.

In the context of progressing globalisation and because of lower economic growth and competitiveness than in the baseline scenario, more European businesses were taken over by foreign, non-European companies through mergers and acquisitions, so that by 2030 the European economy has become more dependent upon external decision-makers than in the case of the baseline scenario.

The dichotomy in long-term growth processes observed in the baseline scenario between metropolitan and non-metropolitan areas is less strong in the cohesive scenario, especially in the cohesion countries where rural areas are strongly supported. Compared with the baseline scenario, metropolitan areas are less favoured, both in eastern and western Europe. This does not mean, however, that they do not progress in absolute terms. In the cohesion countries metropolitan areas and other large agglomerations are significantly supported, both in terms of infrastructure and of technological endowment. A major difference with the baseline scenario is, however, that small and medium-sized towns in less developed regions are more strongly supported, especially as far as services of general interest are concerned. The process of economic diversification of rural areas is much stronger than in the case of the baseline scenario. In the fertile areas of France, Germany, and Poland, agricultural production further modernizes. In these areas, food production competes strongly with the production of energy crops. In Eastern and Southern Europe rural areas, stimulated by RDP and the SF's, become economically more diversified. Both types of rural areas become more socio-economically viable. In Western as well as in Eastern Europe there are a decreasing number of rural areas experiencing marginalisation and abandonment. These are rural areas where the demographic situation (high level of population ageing), the production conditions (low level of soil fertility, increasing drought) and the attractiveness are very unfavourable. Despite all efforts the socio-economic viability of these areas lags behind. Urban-rural relationships and partnerships intensify more in rural areas, around medium-sized and small towns than in more urbanised regions around metropolitan areas, as in the case of the baseline scenario.

Competitive scenario
The scenario is based on the assumption of a significant reshaping of EU policies originating in the poor results of the implementation of the Lisbon Strategy during the period 2000-2005. The low level of competitiveness of Europe compared with that of the USA and large emerging economies has called for an in-depth revision of public interventions, in particular at the EU level. The EU budget is being reduced and EU expenditures are being targeted towards R&D, education, ICT and strategic external accessibility, including in structural policies. The CAP is subject to rapid and radical liberalisation, with a significant reduction of support, of external tariffs and of export subsidies. The budget of structural policies is also being reduced, with a proportion of former EU interventions being re-nationalised and EU support being concentrated on the most competitive areas of less developed regions. As a counterpart, public services are further liberalised and privatised, labour markets are regulated in a more flexible way and the third pillar of EU policies (foreign policy, justice and security) is being strengthened. Widening of the market through further EU enlargements is part of the strategy of increased competitiveness. After Romania and Bulgaria joining the EU in 2008, the Western Balkans will join in 2015 and Turkey and Ukraine in 2020. The neighbourhood policy is being strengthened and the Maghreb countries are integrated into the European Economic Area.

The competitive scenario generates globally somewhat stronger economic growth at the EU-25 level, so that the EU25 average is higher than in the case of the baseline scenario. The territorial patterns of regional demographic economic development in Europe up to 201520 are however broadly similar to those identified in the baseline scenario, but with a number of differences, mainly in the intensity of the evolution process, in particular:

- the global European population by 2030 exceeds that of the baseline scenario. At regional level, the differences are particularly strong in western Europe, with stronger population growth (or lower population decline) in a number of regions belonging to both the pentagon (north-west France, including Paris, Randstad, Rhein-Ruhr, Rhein-Main and metropolitan regions of South-Germany, northern Italy) and the peripheries (regions of southern France, various central and southern Italian regions, Spanish regions of the Mediterranean coast, metropolitan regions of Portugal, southern Ireland, central Scotland, southern Sweden and southern Finland). Regions with metropolitan areas and large cities are clearly favoured, both in the pentagon and outside. In central and Eastern Europe, the differences with the baseline scenario are less significant. The metropolitan regions of Prague, Bratislava, Budapest, Bucharest and Sofia are however clearly favoured and, to a lesser extent, the Baltic States and numerous Polish regions. Compared with the baseline scenario, the least favoured regions are rural regions, both in the centre and in the peripheries. The demographic evolution of different types of areas is diverging more markedly than in the baseline scenario, with areas classified as vibrant in population terms becoming more so and many de-populating areas continuing to be net exporters of people – especially young people. Compared with the baseline scenario, population ageing by 2030 is much stronger in a number of peripheral rural regions, for instance in northern Spain, southern Portugal, eastern Romania and along a stretch running from the southern parts of East-Germany to the eastern parts of

Poland. Population ageing is less pronounced in northern Italy, south-west Finland, central Sweden and southern France.

- With respect to the baseline, the more expansive GDP growth (until 2015) is in reality unevenly distributed in European regions:

  - a clear tendency towards a more concentrated development in strong areas of each country, reflecting the "champions" growth assumptions;
  - as a consequence, in Western Europe, a reinforcement of some regions of the Pentagon area, together with most of Great Britain and Northern and Central Italy countervail the low relative performance of mainly rural areas especially of Greece, Central France, Central Spain, Northern Scotland, Northern Ireland, the north of the Republic of Ireland and Northern Scandinavia;
  - while the most peripheral regions are those performing relatively lower than the baseline scenario, within peripheral areas, exceptions are presented by most of the Megas, reinforcing the tendency of a concentrated development. Lisbon and Porto in Portugal, Madrid, Catalonia, Valencia and Bilbao in Spain, Athens in Greece, Paris, Haute-Normadie and Nord-Pas de Calais in Northern France are all regions with a higher performance than in the baseline;
  - while the assumptions favour growth in the megas and agglomerated areas, a less intuitive result is the good relative performance with respect to the baseline scenario registered also by the potential megas, like Cologne, Bonn, Bologna (in Emilia-Romagna), Nice and Marseille (Provence-Alpes-Côte d'Azur) and Lyon (Rhônes-Alpes), Bratislava and Budapest;
  - the trend towards a more concentrated development is clearly evident in Eastern countries, where all capital regions (with the addition of Timisoara) register a greater performance with respect to the baseline scenario. On the contrary, in these countries, all rural areas register a lower performance than in the baseline scenario.

Considering the changes in relative position of European regions between 2002 and 2015 compared with the baseline scenario, winners are very clearly the metropolitan regions, both in western and in eastern Europe, but especially in the pentagon. Regions which are most strongly loosing are the rural regions of Sweden, of East-Germany and the alpine regions of Austria. Other important loser regions are the rural areas of western Europe (central France, central Spain, southern Portugal, Ireland, northern and southern Germany, most Finnish regions, numerous Italian and Greek regions).

When looking at the per capita GDP level achieved in 2015 in the competitive scenario, some interesting patterns and trends emerge with respect to the baseline scenario:

- the catching up process between Eastern and Western countries is more pronounced in the agglomerated and mega regions. In Eastern countries, these areas achieve in fact, with respect to the baseline scenario, a higher per capita GDP. This trend explains the decisive increase in the intra-national regional disparities with respect to the baseline;
- a higher per capita GDP level with respect to the baseline scenario emerges in some regions of Western Europe, especially in the agglomerated and mega

regions, in parts of Scotland, in southern Ireland and in some regions of the Pentagon area, especially in Western Germany, in Benelux and in south-eastern England;

As a result of these trends, while intra-national disparities grow with respect to the baseline scenario, disparities among countries decrease more than in the baseline, thanks to strong catching up processes in lagging countries through their national champions.

Compared with the baseline scenario, the demographic situation by 2030 is less declining thanks to significant immigration flows and, secondarily, to a certain revival of fertility rates. The European population has become more cosmopolitan and multi-racial. The median age of the European population is lower and the demographic potential higher in the competitive scenario than in the baseline scenario. Inside Europe, demographic imbalances have significantly increased, with a growing population in and around a large number of metropolitan areas and large cities and population decline and out-migration in numerous peripheral and/or rural areas, both in the pentagon and in more peripheral countries. The impact of selective immigration and of internal migrations on the labour markets, especially on those of metropolitan areas, is significant, so that shortage of labour force is less perceived as a constraint to economic development than in the baseline scenario. Population of immigrant origin (both born in Europe and just coming from outside) is less integrated in the European society than in the baseline scenario because of insufficient integration policies and of a certain amount of illegal immigration still going on. Increasing xenophobia, self-protective attitudes and social unrests are more developed than in the baseline scenario.

Territorial integration and cooperation is significantly different from the situation in the baseline scenario. The networking of metropolitan areas progresses significantly, driven by the private economy and especially by large companies. Large cities of central and eastern Europe are also included in this process, favoured by the strengthening of the Trans-European corridors and of the broadband networks. Border regions cannot rely anymore on European assistance schemes which, until 2013, provided specific support for overcoming border specific hindrances. In addition, the overall absence of a strong cohesion policy leads to a situation where the majority of the economically weak border regions remain in a status of backwardness, particularly in terms of low employment opportunities respectively high unemployment rate. Rural areas are subject to an evolution which was already noticeable in the late 1990s and early 2000s consisting in a growing dichotomy between well-off and less developed rural regions generated mainly by both the proximity to metropolitan areas, the attractiveness and the intensity of agriculture.

Conclusions

At the time of writing this document, the ESPON Project 3.2. is not yet completed. Conclusions presented here have therefore only a provisional character.

A particularly important aspect is that the European global context is changing and is likely to change even more during the next two or three decades. Exogenous factors such as population ageing, the acceleration of economic globalisation and of climate change, the emergence of a new energy paradigm are likely to have significant impacts on the European territory, independently from the general policy priorities (cohesion versus competitiveness) chosen. It is therefore essential that all

scenarios provide appropriate answers to these new challenges. This requires quite innovative and substantial approaches.

Looking more precisely at the impacts of the policies chosen, the resulting territorial images of Europe by 2030 are quite different. It results however that growing territorial balance inside Europe may occur at the expense of competitiveness and inversely, if conventional policies are applied. The search of policy approaches likely to deliver a reasonable level of territorial cohesion combined with stronger competitiveness supposes here again quite innovative approaches, departing in several respects from present practice. This has to be highlighted in the roll-back scenario which still has to be elaborated.

NETWORKING FOR APPLIED TERRITORIAL RESEARCH AT THE EUROPEAN LEVEL:
BRIEF CONFERENCE REVIEW AND AN OUTLOOK ON FUTURE COOPERATION

by Thiemo W. Eser

Dr. Thiemo W. Eser is senior official at the Ministry of the Interior and Spatial Planning of the Grand Duchy of Luxembourg. He is responsible for the Managing Authority of ESPON as well as territorial cohesion and urban policy at the EU and the Council of Europe level.

This conference on European Territorial Research was the first conference of ESPON dedicated to the contact and communication with the research community. Therefore it is very important to draw some conclusions on the future networking and collaboration with the research community currently represented by the co-organisers of the conference, i.e. the Association of European Schools of Planning (AESOP), the European Council of Town Planners (ECTP), the European Regional Science Association (ERSA), EUGEO, and the Regional Studies Association (RSA).

Topics in discussion

Attending the conference lively discussions were apparent: The ESPON studies and research papers prepared and presented were challenging the discourse methodologies, scientific approaches in an interdisciplinary environment. Networking was obviously taking place and many researchers participating in ESPON studies are members of the associations.

Three topics have been addressed in various contexts and are worthwhile being communicated to those who could not participate in the conference:

a) ESPON is open, which means everybody can participate in the tendering processes of projects. The studies are accessible in the process of elaboration with all the advantages and also the disadvantages. The advantage is transparency in the one hand. However on the other hand, the research teams feel exposed showing intermediate results;
b) ESPON is interdisciplinary, which eases a cross-disciplinary thematic coverage and communication but may also require compromises on the exploration of the potentials of sophisticated and specialised methodological approaches;
c) ESPON is applied research that means the initiative for the research lies in the policy process leading to strict timetables in order to serve the policy at the right time. The formulation of research themes derives from the point of view of a policy demand and maybe even a policy context. In particular the last point makes the difference to other research programmes such as the Research and Development programme of DG Research at the EU level.

However, another point of discussion is essential and deserves to be highlighted: the integrity of the research and researchers in the ESPON programme as a study programme driven by policy demand. Policy-makers, once having decided to consult sciences and research, tend to demand the justification of policy decisions this is mostly not an explicit demand but somehow "in the air". Policy decisions often require normative assumptions about basic values of the society which are not necessarily justifiable in scientific terms – the question of policy is and remains the question of choice! Certainly researchers feel this demand and sometimes they see themselves in a situation asked to answer an, in fact, normative questions. A clear solution lies within an applied research programme such as the ESPON in an approach, which does compromise neither researchers nor policy makers: description, explanation and projection of trends at the one hand and formulation of policy option with regard to basic normative assumption for the policy makers at

the hand. This approach informs policy making where information is require but leaves the choice to those who have been elected (politicians) or who have to implement the decisions (administrations). In any case this fine but crucial line between description and explanation on the one hand and normative questions of policy making on the other hand has to be defined and debated for each research project in the ESPON programme but also for the ESPON programme as a whole.

Participation in the ESPON programme
Addressing further the participation in ESPON projects it appears that the kind of applied research demanded under the ESPON programme attracts in particular consortia involving different types of organisations and taking advantage of their particular strength. Universities contribute with state of the art scientific knowledge and innovative approaches, consultancies bring in their experience in studies directly addressed to practitioners and decision makers, and bigger national and regional research institutes often dispose of in-depth knowledge about data and mapmaking and policy oriented reporting. A well balanced mixture of these competences is obviously a success factor for the applied research carried out.

The participation in ESPON projects is open to all researchers,of course according to some rules (public tendering, principle of collaboration between the trans-national project groups, ESPON Contact Points and Monitoring Committee). These conditions contribute to building an open European environment for applied territorial research. Other elements are information exchange, thematic discussions and networking to be further developed from the ESPON side. Further progress on the support for European territorial research follows basic lines such as a continuation and fostering of the cooperation integrating relevant European academic organisations, gradually enlargement of the disciplines involved in the networking, investments in the young researchers, support of the communication process with more scientific conferences and/or participation in events organised by the partners and the improvement the scientific acknowledgement of research done in future ESPON projects, possibly through peer reviews.

Orientations for a future ESPON Programme
These elements need to be settled in the new ESPON programme and the work on formulating a new programme is in progress. Reference point of the new programme will be the user orientation, i.e. increasing the value of the information, bringing policy making into dialogue. The following five basic elements of the programme are currently in discussion:

a) Evidence and knowledge on territorial development and cohesion (applied research projects),
b) Targeted analytical deliveries (user driven projects)
c) Monitoring and scientific platform (publicly available ESPON Data base, core indicators, TIA)
d) Communication and networks of stakeholders including the scientists and policy makers and planners
e) Technical and analytical support to carry through the programme

With regard to the outcomes of this conference the following more concrete points should be earmarked for the further elaboration of the next ESPON programme: The kind of forum as organised in this conference is needed on a regular base. Obviously there is a broad interest to participate in this type of organised conference

allowing exchange on very specific topics. In addition a more open form of conference should be considered which allows a broader involvement of younger scientist and where researchers can submit own papers on the subjects defined. In fact this could be also achieved by incorporating specific strands at the statutory annual or bi-annual conferences of the associations if they so wish. A point of discussion is as well the consideration scientific committees or sounding boards either for the whole programme of by projects. A publication strategy with an orientation towards a scientific audience needs to be further investigated: one option could be to organise thematic special issues of those journals which are already on the market and where associations as responsible editors could build a bridge to ESPON.

Further and regular consultation between the ESPON responsible authorities and the associations will is crucial for the ESPON programme for all points mentioned and further issues coming up. Contact and cooperation with the associations helps securing a broad involvement of those researchers active in the field and rooting the ESPON programme in the scientific community. Vice versa the ESPON offers via the associations a platform of exchange and discussion, access to data and tools. Complementarities and synergies are obvious and should be further explored.

Final remarks

This conference was not only interesting from the point of interest of a scientist. It was also interesting for representatives of the Monitoring Committee (not being scientists or planners) to see which issues are raised and how these issues are discussed among scientists and planners. This is another pace of systematically bringing practitioners, scientist and practitioners together. It seems as it is not always important for the practitioners to really understand each detail discussed by the scientist but it is already useful to receive an understanding and get a feeling for where there are critical points in European applied territorial research.

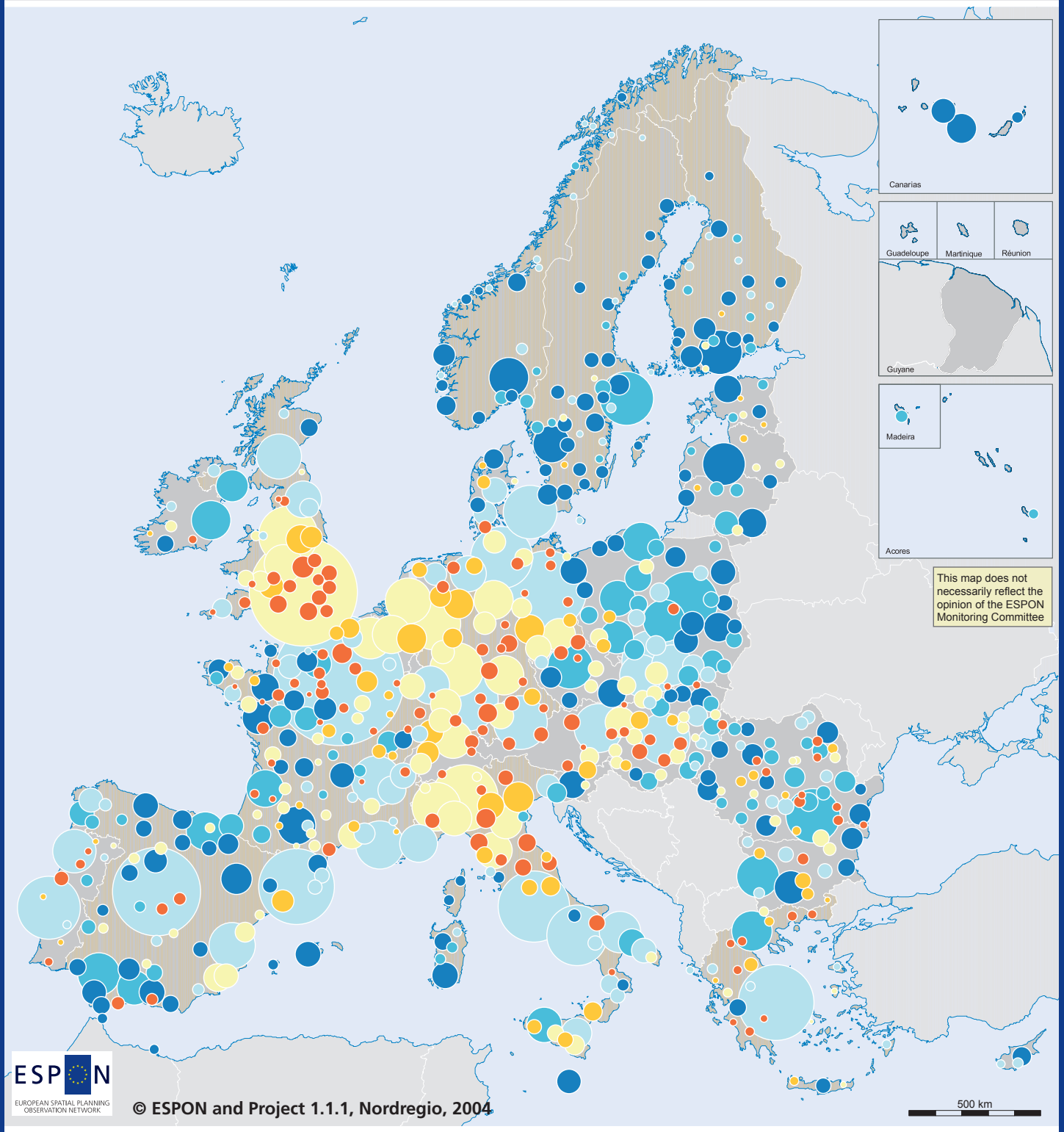
Finally it is worthwhile recalling what the Minister said in his welcome speech to this conference: The ESPON programme is devoted to the mission to produce results perceivable by non scientist and applicable for policy making. This means an important transfer and transformation and condensation of knowledge. The transformation process is a task in its own and cannot be overestimated. The conference has contributed to the awareness about the transformation task and has also provided some common ground to achieve this task. This will always be the key challenge of the ESPON programme which requires the willingness to communication and cooperation by all sides involved. The Managing Authority of the ESPON in the name of the Monitoring Committee would like to expresses their sincere thanks to the Association of European Schools of Planning (AESOP), the European Council of Town Planners (ECTP), the European Regional Science Association (ERSA), EUGEO, and the Regional Studies Association (RSA) and as the host to the University of Luxembourg for commencing this cooperation in a good and constructive spirit.

Finally special thanks go also to those researchers all over Europe who contributed with great effort and enthusiasm to the ESPON results. A programme like ESPON can only be successfully implemented with the awareness of a certain level team sprit.

COLOUR MAPS AND ILLUSTRATIONS RELATED TO THE CONTRIBUTIONS

Regional polycentricity across Europe increases the contrasts between core and periphery

Contribution: A first step towards an improved understanding of urban profiles and polycentric development potentials . Figure 3, page 45



Difference between the European rank of individual cities (according to their PUSH population), and that of corresponding PIA (considering the main node of each PIA only).

+516
+100
+50
0
-50
-100
-338

PIA rank > PUSH rank

PIA rank < PUSH rank

FUA population according to national FUA definition

11,175,000
7,650,000
2,900,000
850,000
13,000

Geographical Base: Eurostat GISCO

Origin of data:
EUROSTAT, National Statistical Offices
National experts

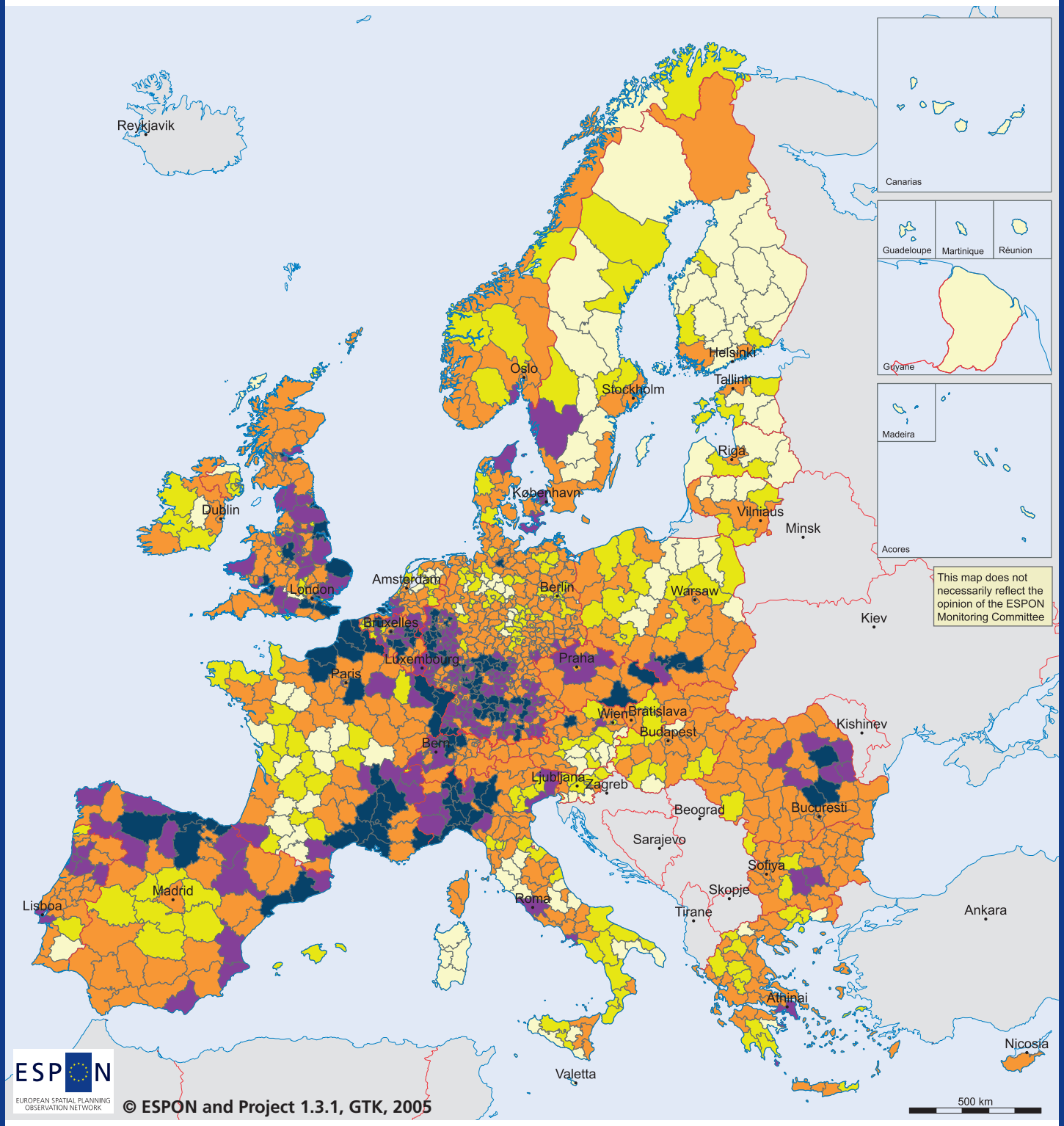
Data sources:
Nordregio, ESPON NUTS 5 database

PUSH delimitation: RRG
PIA identification: Nordregio

Partly made with Philcarto
http://perso.club-internet.fr/philgeo

The aggregated hazards of Europe

Contribution: Typologies of hazards and risks in Europe supporting policy development. Figure 1, pages 58 and 59



Hazard classification

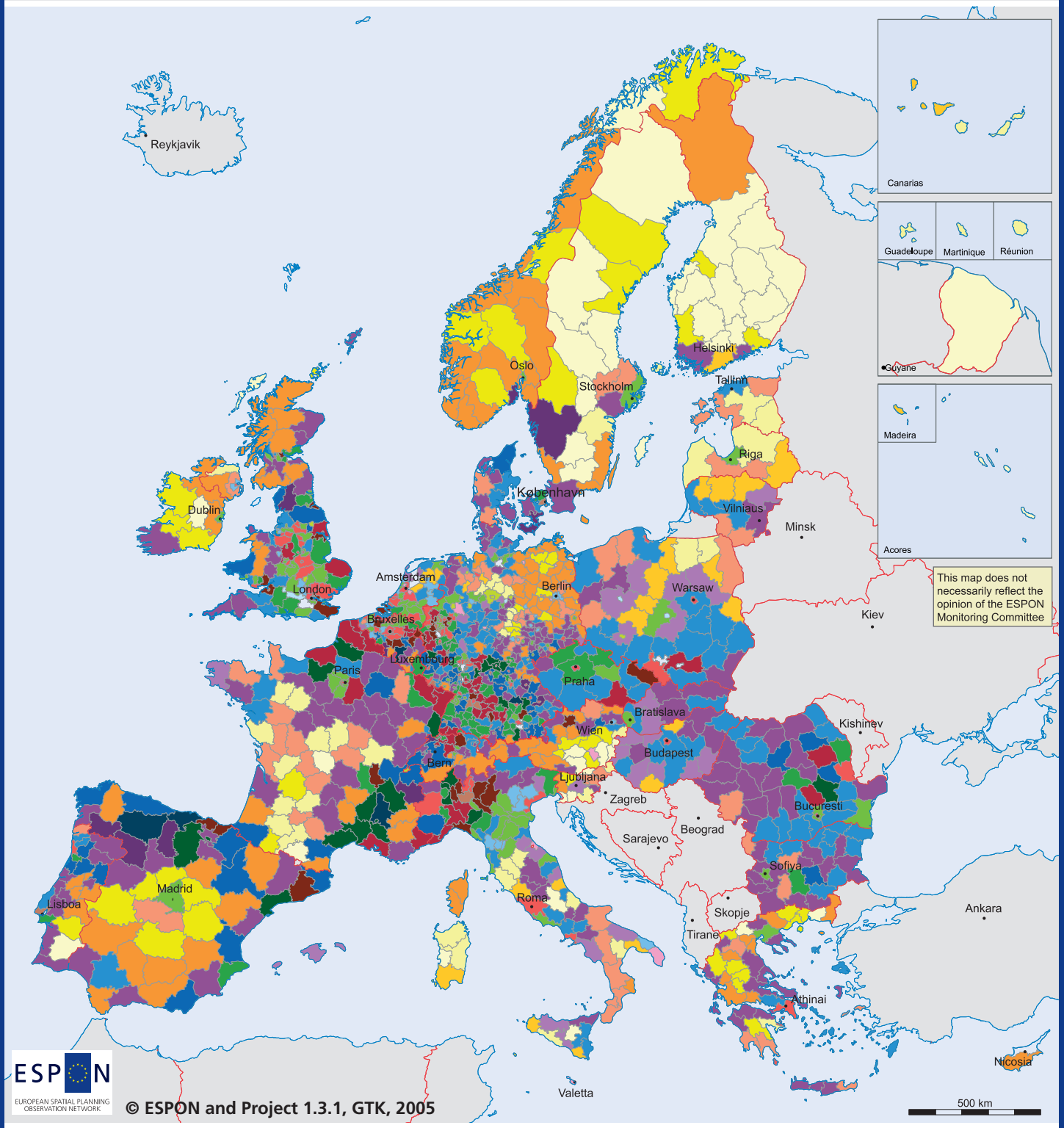
This map shows the aggregated hazard typology based on 15 hazard indicators. Every indicator gives the value from 1 to 5 depending on the magnitude of the hazard in the NUTS3 area. For the class "No data" value is 0. These values are then weighted based on expert opinion (Delphi method questionary). At the end the sum of 15 weighted indicators are classified on the basis of percentile rank. For instance, NUTS3 areas that belong in the 90-100 percentile have a score greater than or equal to 90% of the total of all the summed hazard values.

- 0-10 percentile
- 10-25 percentile
- 25-75 percentile
- 75-90 percentile
- 90-100 percentile
- Non ESPON space

Source: ESPON Data Base

Aggregated hazard risks in Europe

Contribution: Typologies of hazards and risks in Europe supporting policy development. Figure 3, page 59



Degree of vulnerability

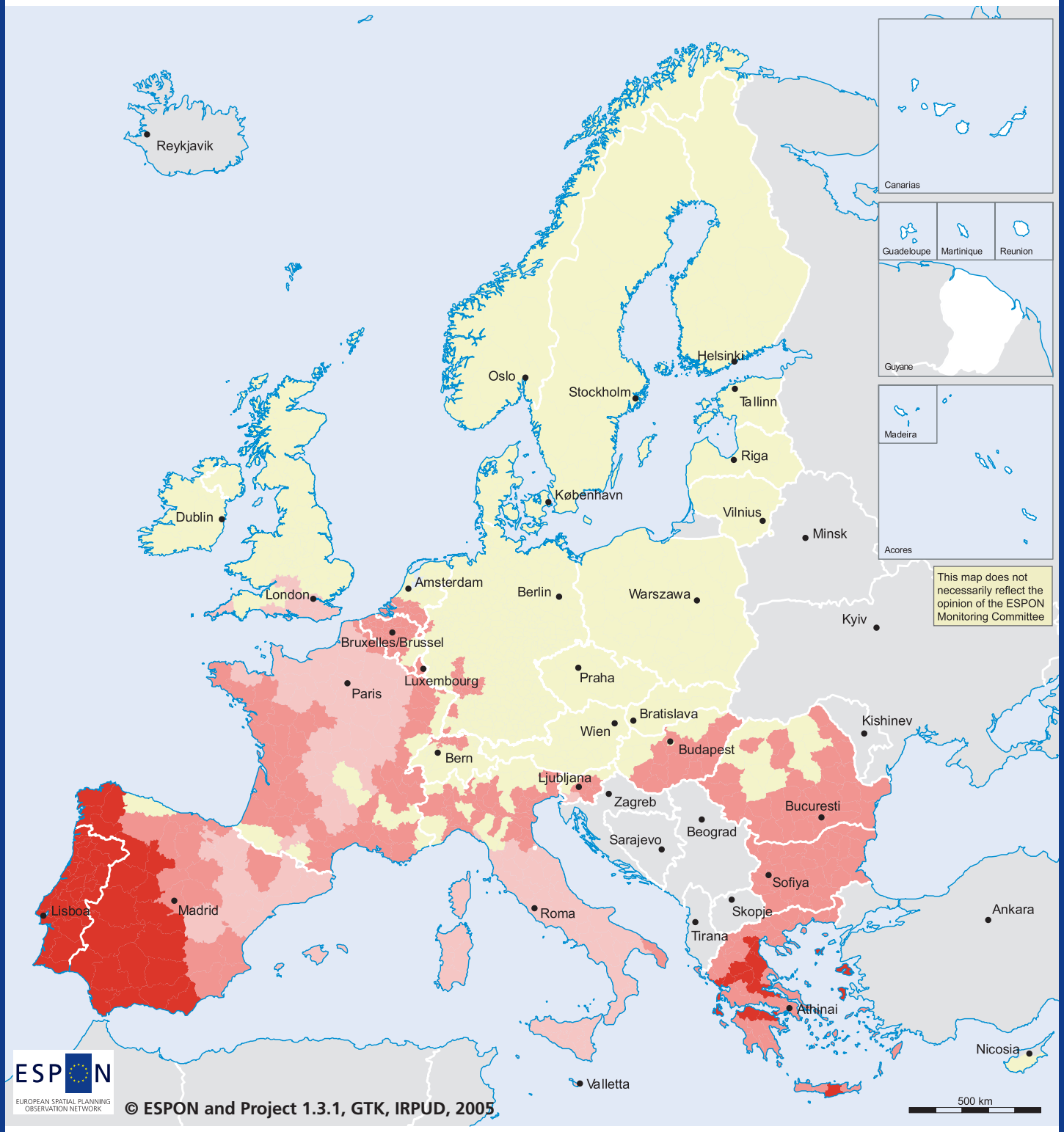
Intensity of hazard	1	2	3	4	5
1	2	3	4	5	6
2	3	4	5	6	7
3	4	5	6	7	8
4	5	6	7	8	9
5	6	7	8	9	10

GDP 2000 Eurostat Newcronos Regio
Population density 1999 Eurostat Newcronos Regio
National GDP 2003 Eurostat
CLC90 EEA

Source: ESPON Data Base

Change of dry spell length affecting drought potential

Contribution: Typologies of hazards and risks in Europe supporting policy development. Figure 4, page 61



Change of dry spell length affecting drought potential

This map represents the connection between change of dry spell length (The Prudence project model database) and drought potential , based on precipitation deficit recordings 1904 -1995.
The map is based on climate model data and thus shows scenarios and not predictions or forecasts

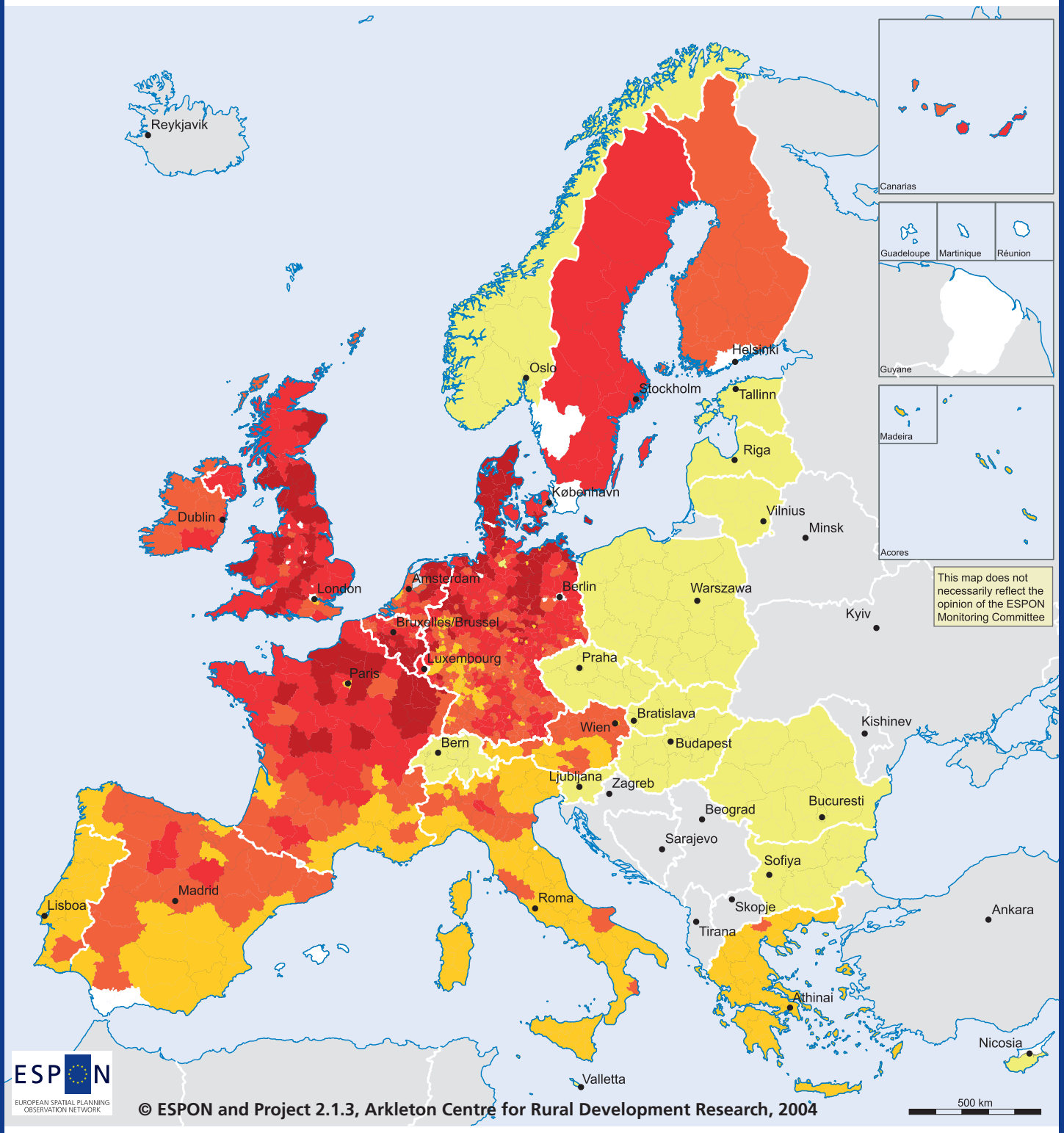
- no impact or decreasing impact
- very low increasing impact
- low increasing impact
- moderate increasing impact
- no data

Regional level: NUTS 3
Origin of data: ARIDE final report (2001)
The Prudence project model database

Source: ESPON database

Total Pillar 1 Support per AWU, 1999

Contribution: The territorial impact of the common agricultural policy. Figure 1, page 74



'000 Euros per AWU, 1999

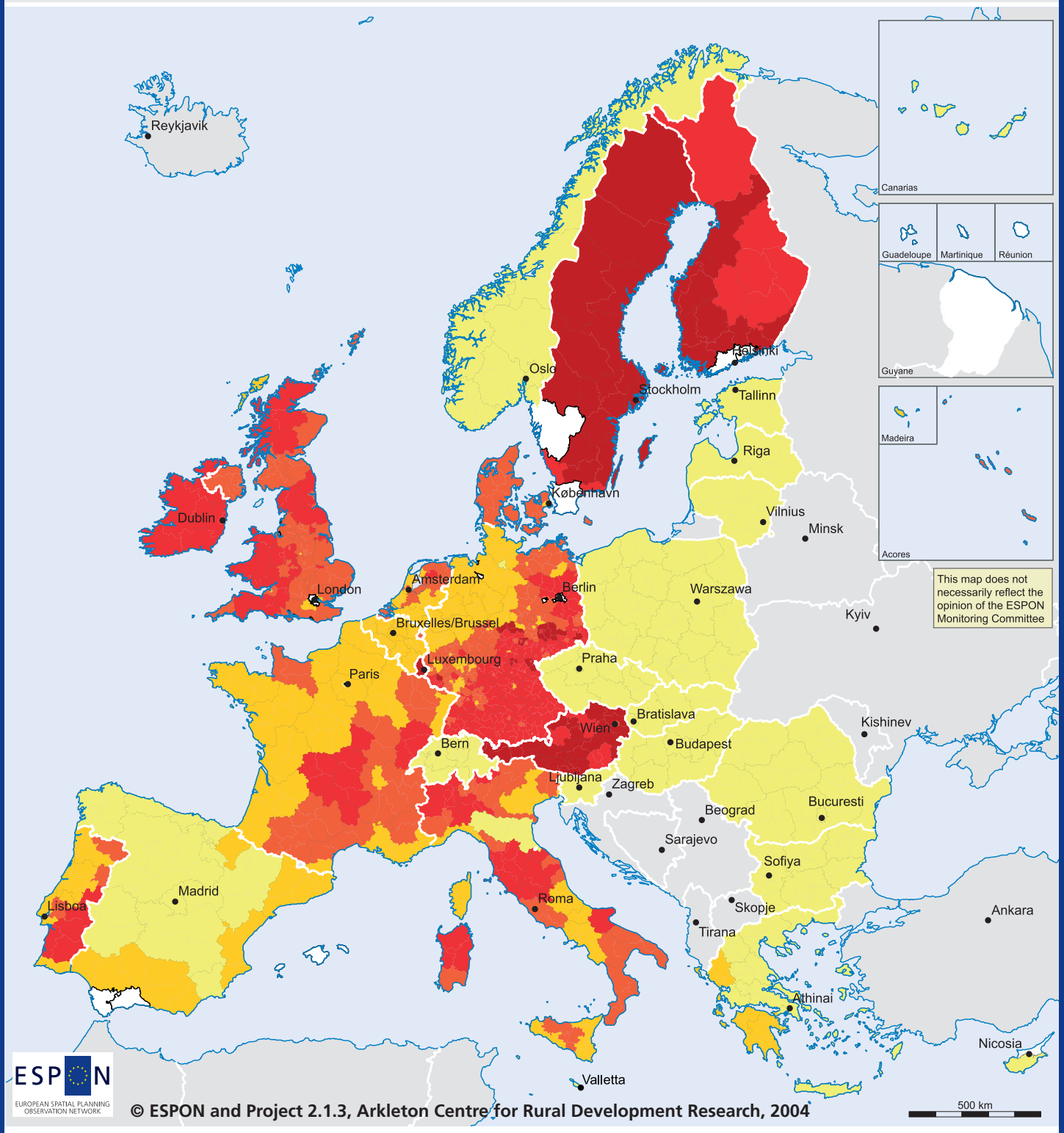
- 0
- Less than 10
- 10 to 25
- 25 to 40
- More than 40
- No data

Regional level: NUTS 3
Origin of data: ESPON 2.1.3

Source: ESPON database

Total Pillar 2 Support per AWU, 1999

Contribution: The territorial impact of the common agricultural policy. Figure 2, page 75



'000 Euro per AWU, 1999

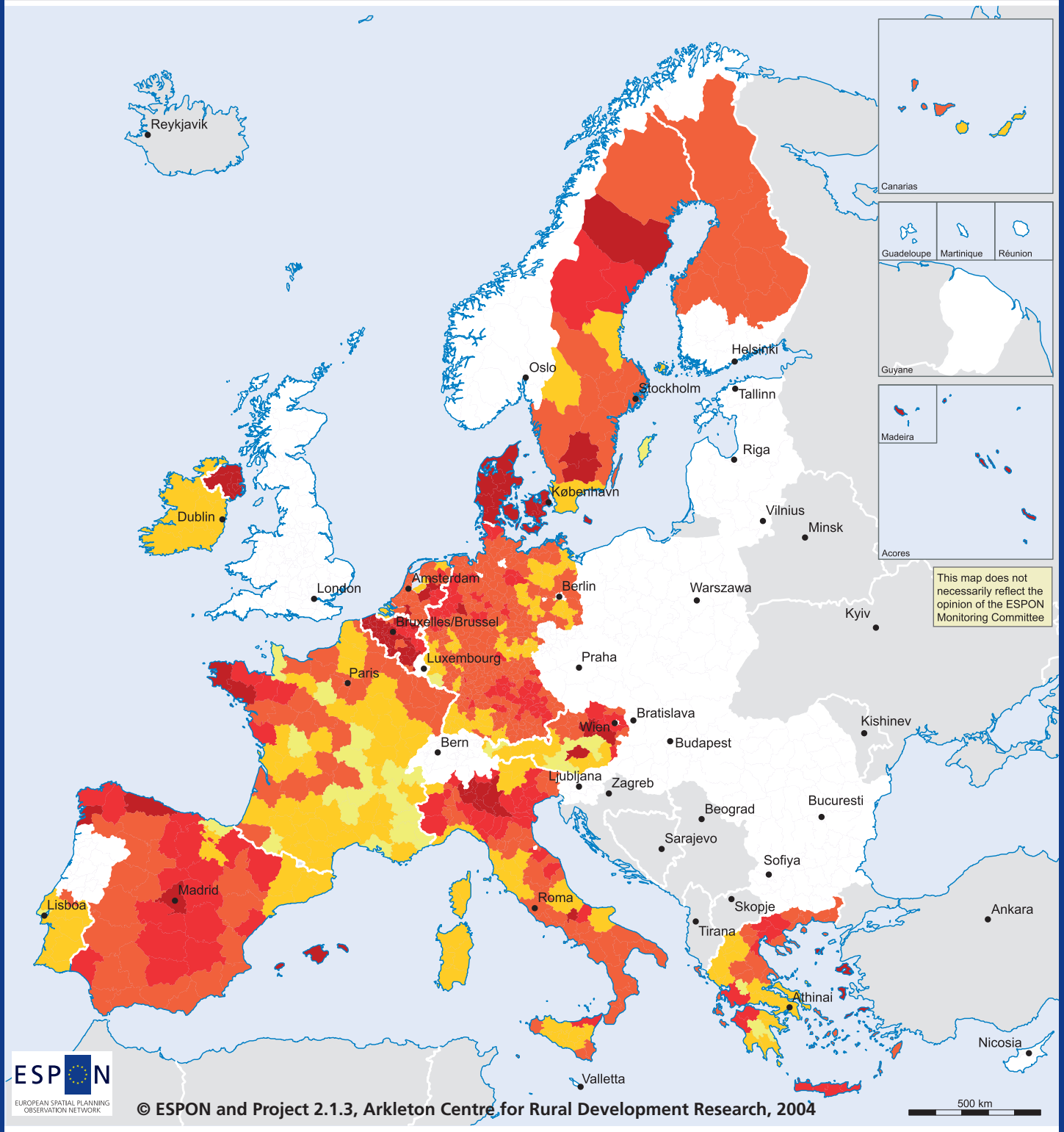
- 0
- Less than 0.25
- 0.25 to 0.75
- 0.75 to 2.5
- More than 2.5
- No Data

Regional level: NUTS 3
Origin of the Data: Project 2.1.3

Source: ESPON Database

Percentage change in farm incomes arising from MTR Proposals

Contribution: The territorial impact of the common agricultural policy. Figure 3, page 77



Change from reference scenarion (%)

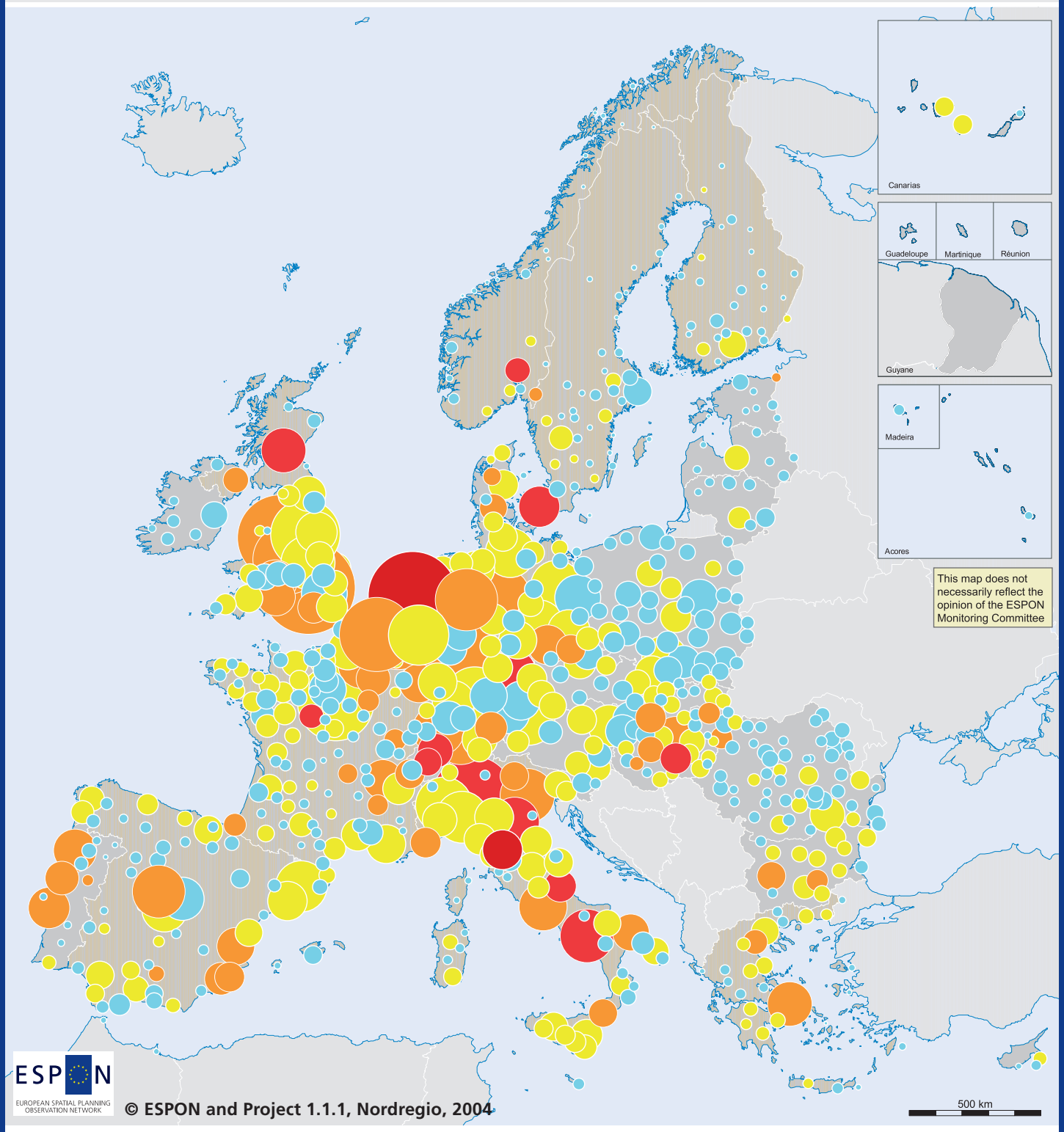
- Less than -5
- -5 to 0
- 0 to 2
- 2 to 5
- More than 5
- No Data

Regional level: NUTS 3
Origin of the Data: Project 2.1.3

Source: ESPON Database

Level of multi-scalar complexity in PIA's

Contribution: Governance an polycentric urban development: the territorial and political translation of spatial ideas. Figure 4, page 125



Number of hierarchical levels of integration in potential Polycentric Integration Areas.

Isolated Functional Urban Horizon

Number of levels of integration

- 1 level
- 2 levels
- 3 levels
- 4 levels

PIA population

- 22 262 000
- 10 000 000
- 6 000 000
- 1 500 000
- 18 652

Geographical Base: Eurostat GISCO

Origin of data:
National Statistical Offices,
Eurostat, National experts

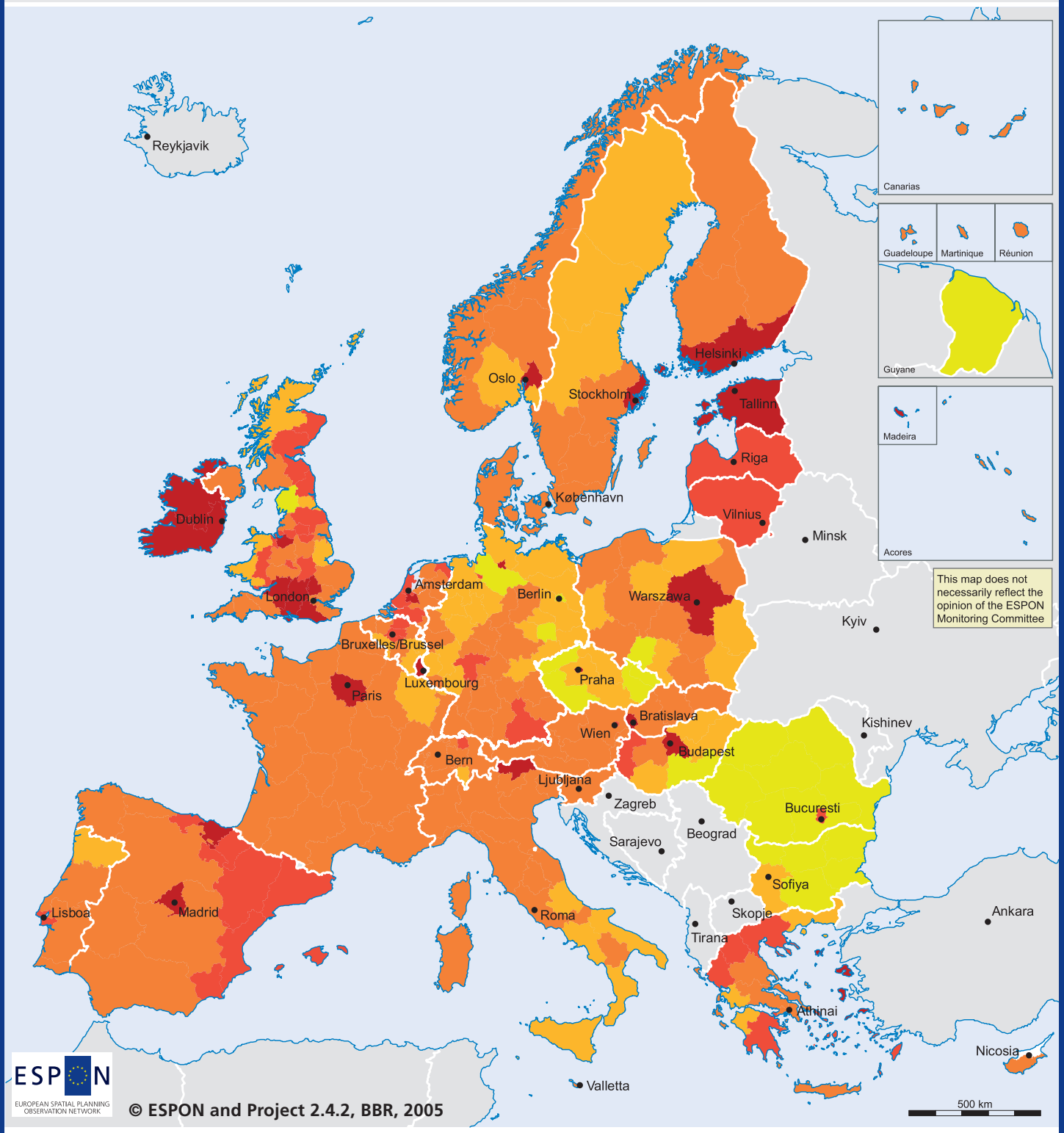
Data sources:
Nordregio, ESPON NUTS 5 database

PUSH delimitation: RRG
PIA identification: Nordregio

Partly made with Philcarto
http://perso.club-internet.fr/philgeo

Final RCE – Economy

Contribution: Interdisciplinary European classifications of regions. Figure 2, page 139



Degree of economic success as an aggregate of 2 indicators:
- GD P (GD P per capita in PPS 2002) +
- GD P growth (Growth in GDP per capita in PPS 1995-2002, in %)

- Below average
- Moderately below average
- Average
- Moderately above average
- Above average

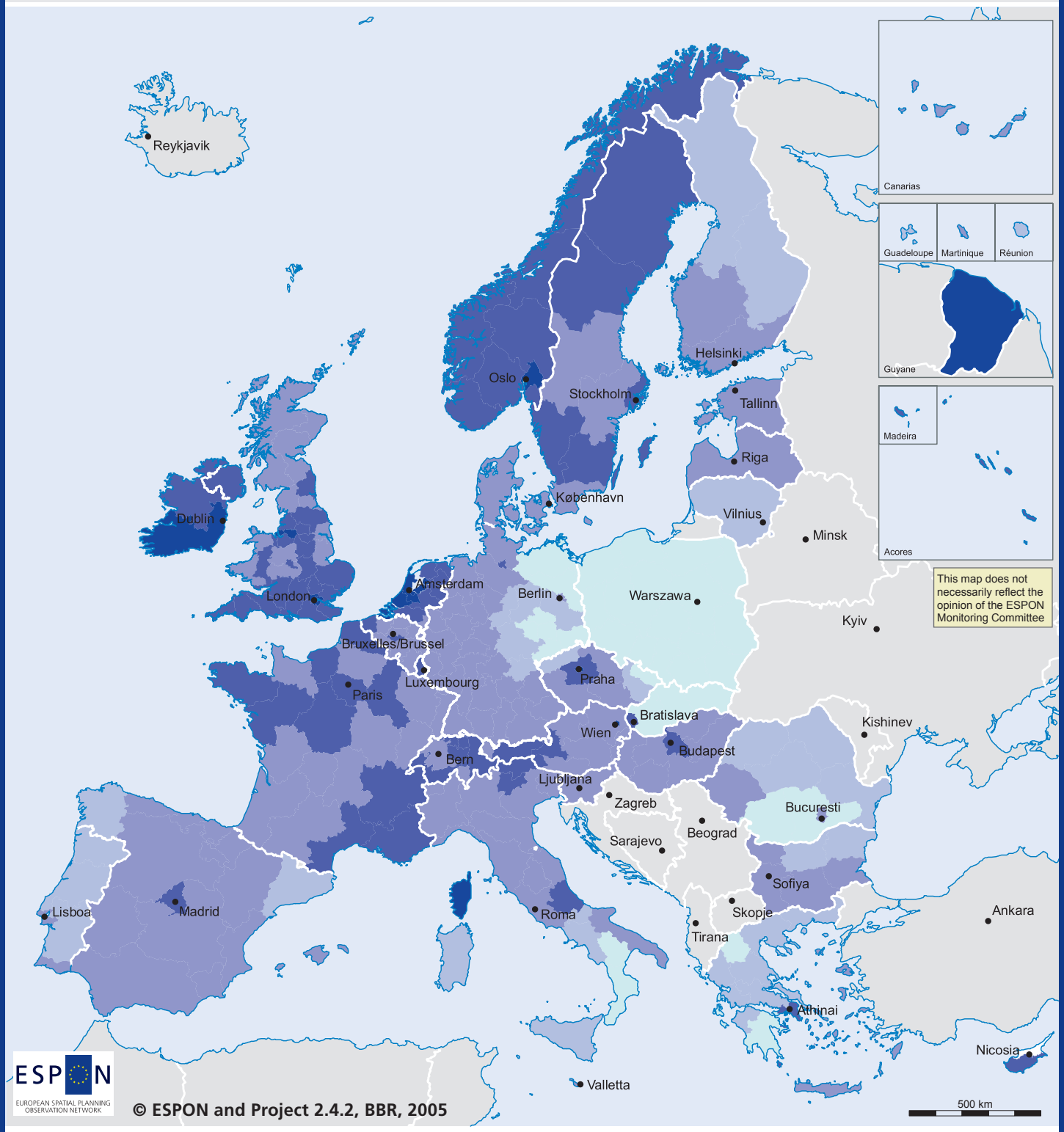
Standardised based on the European mean value

Regional level: NUTS 2
Origin of data: ESPON 2.4.2 BBR, own calculations
Cyprus: data for government controlled areas only

Source: ESPON database

Final RCE – Labour market

Contribution: Interdisciplinary European classifications of regions. Figure 6, page 142



Degree of labour market efficiency as an aggregate of 6 indicators:

- Unemployment (Unemployment rate 2003) -
- Development of unemployment (Change of unemployment rate 1999-2003 in pp) -
- Youth unemployment (Unemployed <25 years per 1.000 inh. 15-<25 years 2003) -
- Labour force replacement ratio (Population ages 10-19 / pop. ages 55-64) +
- Employment density (Number of persons employed per km2 2003) +
- Employment in tertiary sector (Share of total employment 2003) +

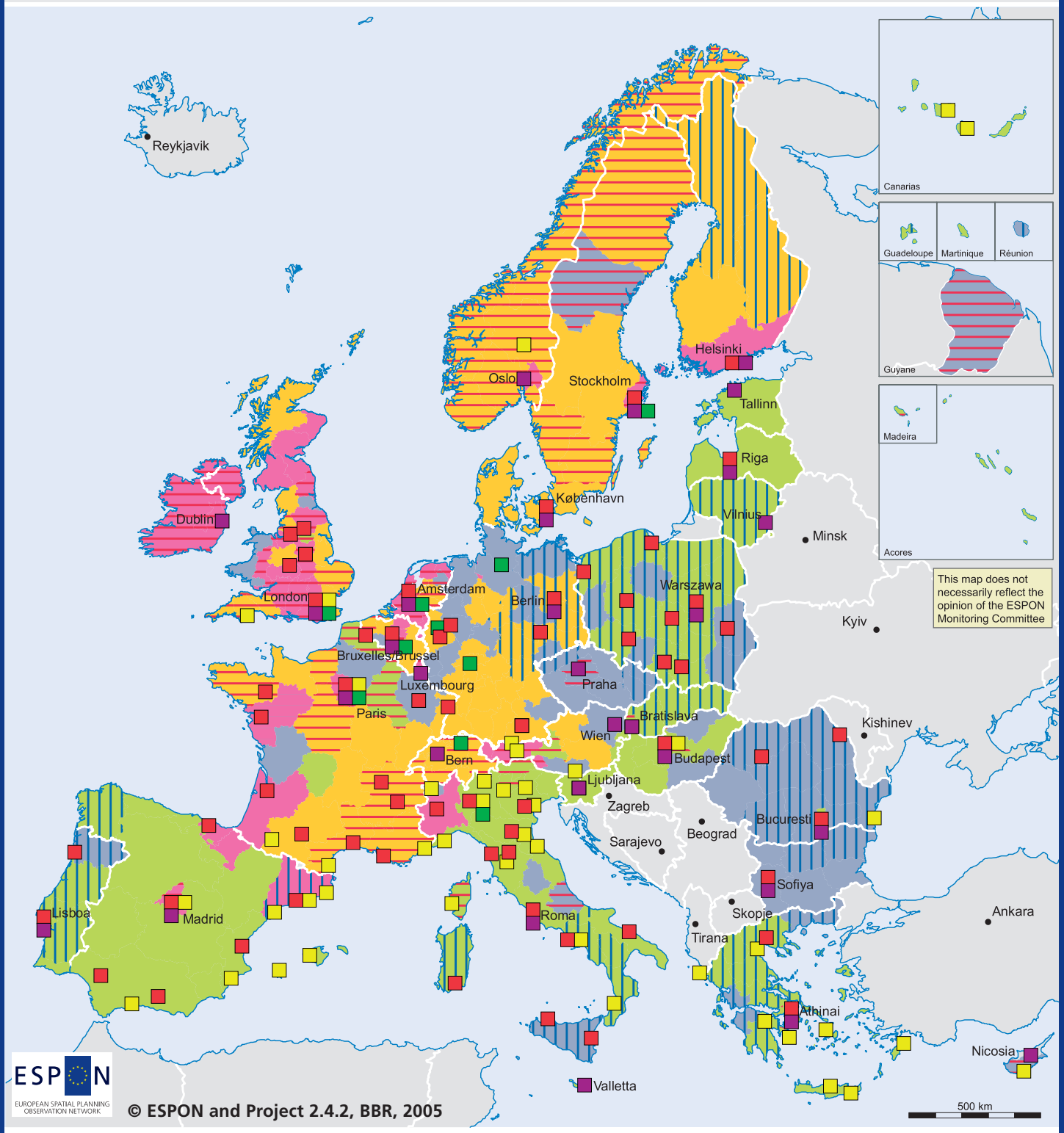
- Below average
- Moderately below average
- Average
- Moderately above average
- Above average

Regional level: NUTS 2
Origin of data: ESPON 1.1.4 ITPS, ESPON 2.4.2 BBR, own calculations
Cyprus: data for government controlled areas only

Source: ESPON database

The Lisbon situation

Contribution: Interdisciplinary European classifications of regions. Figure 9, page 144



Economic setting and Lisbon orientation

- Economically strong with high Lisbon orientation
- Economic growth potential with deficits in Lisbon orientation
- Less distinct economic trend with high Lisbon orientatio
- Weaker economic trend with deficits in Lisbon orientation

Regional level: NUTS 2
Origin of data: ESPON 1.1.1 Nordregip
ESPON 2.4.2 BBr, own calculations

Source: ESPON database

Labour Market
According the Regional Classification of Europe combined indicator value

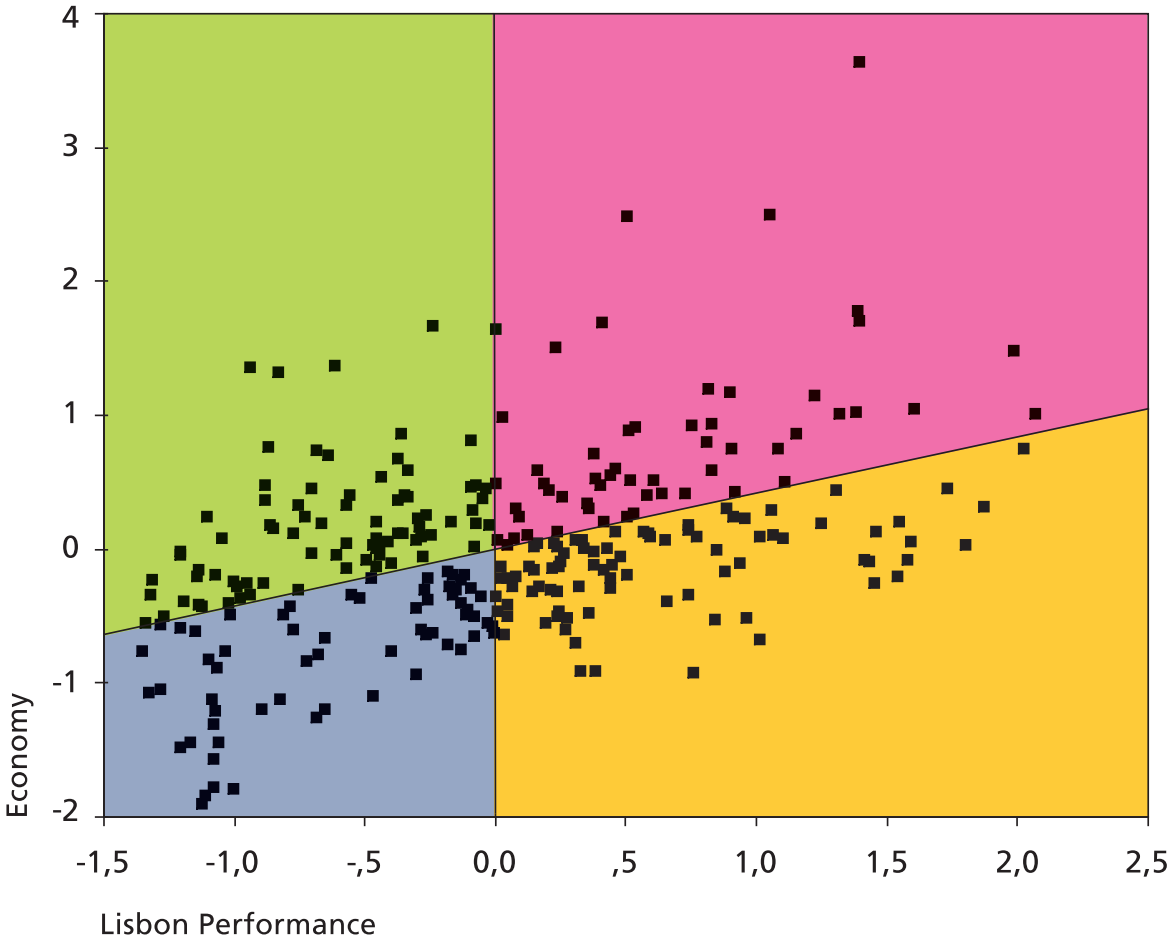
- below average
- above average

Dominance of selected functions of national/european and global significance of the ESPON FUA's

University
Administration
Tourism
Decision making

The relationship of Economy and Lisbon performance

Contribution: Interdisciplinary European classifications of regions. Figure 8, page 144



Economic growth potential with deficits in Lisbon orientation

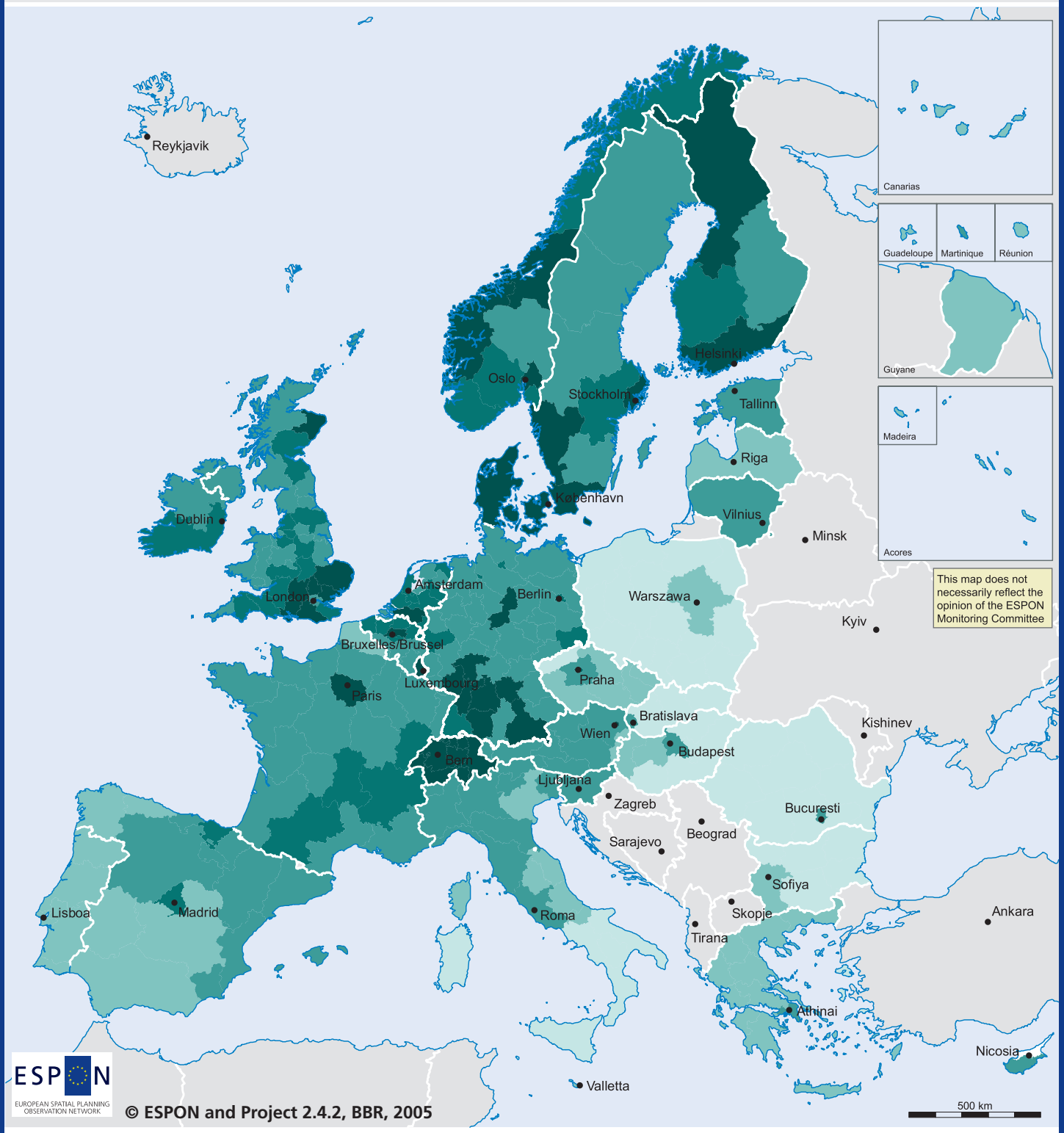
Weaker economic trend with deficits in Lisbon orientation

Economically strong with high Lisbon orientation

Less distinct economic trend with high Lisbon orientation

Final RCE – Lisbon performance

Contribution: Interdisciplinary European classifications of regions. Figure 4, page 141



Degree of lisbon performance as an aggregate of 5 indicators:

- Productivity (GDP per person employed 2002) +
- Employment rate (Employed population / population aged 15-64 2003) +
- Expenditure on R&D (Expenditure on R&D / Total GDP 2001) +
- R&D Business Enterprise Sector (Personnel / 1.000 active person 2001) +
- High educated population (Highly educated population / total educated population 2002) +

- Below average
- Moderately below average
- Average
- Moderately above average
- Above average

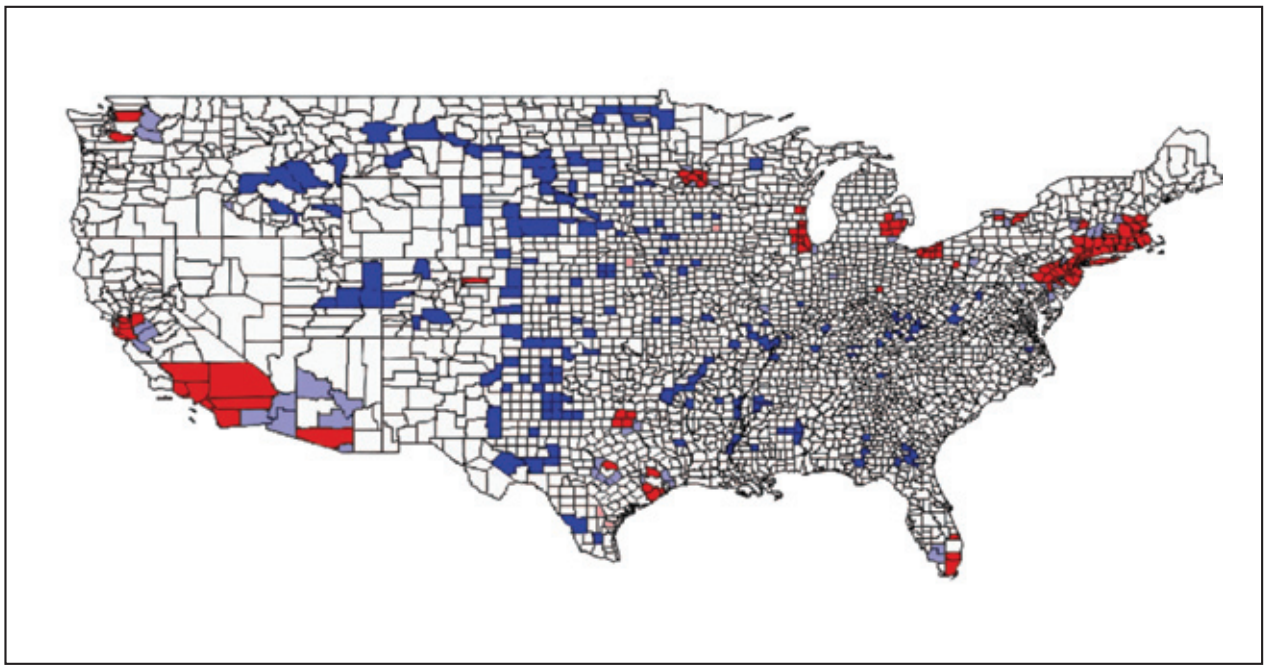
Standardised based on the European mean value

Regional level: NUTS 2
Origin of data: ESPON 2.4.2 BBR, own calculations
Cyprus: data for government controlled areas only

Source: ESPON database

Significant Local Moran values of patent applications by U.S. counties, 1992

Contribution: Spaital data analysis, multiregional modeling and macroeconomic growth. Figure 1, page 154



Source: US Patent Office PATSIC-CONAME and INVENTOR data files, 2001.
Figure 1: Significant Local Moran values of patent applications by U.S. counties,1992 (at least 5 percent significance)

ESPON, European Spatial Planning Observation Network
ESPON, the European Spatial Planning Observation Network, is set up to support policy development and to build a scientific community in the field of European territorial development. The main aim is to increase the general body of knowledge and evidence on territorial structures, trends and policy impacts within the European Union and its regions. ESPON research addresses the 25 EU Member States as well as Norway, Switzerland, Bulgaria and Romania. www.espon.eu

Université du Luxembourg
Teaching and research at the University of Luxembourg are organised in faculties. There are three faculties, the Faculty of Science, Technology and Communication, the Faculty of Law, Economics and Finance, and the Faculty of Language and Literature, Humanities, Arts and Education. The University is research-centered but brings together teaching and research activities. www.uni.lu

AESOP, Association of European Schools of Planning
AESOP is a network of universities and university departments which teach and conduct research within the field of urban and regional planning. The aim of this network is to promote the development of the teaching curricula and research within the Member Schools through regular dialogue, exchange visits and the dissemination of research and best practice. www.aesop-planning.com

ECTP, European Council of Town Planners
The European Council of Town Planners (ECTP) brings together 24 professional town planning associations and institutes from 21 European countries. It is an umbrella association providing its members with a common framework for planning practice, planning education, continuing professional development and the definition of professional responsibilities. www.ceu-ectp.org

ERSA, European Regional Science Association
ERSA is the European Section of the Regional Science Association International. It was founded to promote the free exchange of ideas and viewpoints related to regional science In Europe. Economists played a major role in the early stages of development of the association but, in recent years, the scope of regional science has broadened. Today, geographers, planners, mathematicians and sociologists are also active within the regional science field. www.ersa.org

EUGEO
The objectives of EUGEO are to improve communication and exchange of ideas between member institutions and to act as a lobbying body for geography in Europe, to improve synchronization of geographical research at a Pan-European level, and to identify new scientific and educational responsibilities for geography within Europe so as to position geography more fully within the centre of the European debate. www.eugeo.org

RSA, Regional Studies Association
The Regional Studies Association is a learned society interested in regional development, policy and research. Its activities include: publishing a journal, newsletter and books, running conferences and other meetings, management of an on-line international research register and a branch and international section network. It provides an unparalleled perspective on European planning and is a reputable source of information about European urban planning, geography and regional practice. www.regional-studies-assoc.ac.uk

www.espon.eu

The European Spatial Observation Network (ESPON) is set up to support policy development and to build a European scientific community in the field of territorial development. The main aim is to increase the general body of knowledge about territorial structures, trends and policy impacts in an enlarged European Union. The ESPON programme commenced in 2002.

The purpose of this ESPON Scientific Report is to document the 1st ESPON Scientific Conference and to stimulate the creation of a European territorial research community. As part of this dialogue you are welcome to state your views and proposals by e-mail to info@espon.eu

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