ESPON

EUROPEAN SPATIAL PLANNING OBSERVATION NETWORK

ESPON 3.4.1
Europe in the World

First Interim Report

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A EXECUTIVE SUMMARY

A.1 Essence of the project

The essence of this ESPON project "Europe in the World" might be defined as "grounding globalisation". As spatial planners and geographers we are mainly concerned by the spatial forms that globalisation takes- in Europe or outside Europe- and the spatial strategies that are being developed, both within and outside Europe, to take advantage of the opportunities created by globalization while also addressing its risk. The particularity of this project comparing to other ESPON projects is to introduce a fourth level, the world one, and the trans-scalar relationships in a systemic analysis.

A.2 A systemic framework

System analysis offers the global theoretical framework for the analysis to be developed on Europe in the World. The definition of system ("an entity with a relative level of autonomy, which can be separated from its external context, and which exchanges flows with its environment") is applied to the case of the situation of Europe in the world according to various types of flows with interactions, feed backs and loops. The definition of the environment of the European system (active, passive, integrated) has to be precised. The notion of subsystems and hierarchy of levels can be transposed to the situation of Europe which is at the same time a sub-system of the World and a set of national and regional sub-systems.

A.3 Scale matters

The study of connections between global structures and flows and their replication, impacts, and policy initiatives at macro, meso and micro level implied to base our work and our choices on a deep thought on different kind of scale: geographical scale, time scale, political scale that are interrelated and should be distinguished from the concept of political level.

- *Geographical scale (G-scale).*
An objective approach of the concept of geographical scale could be based on P. Hagget (1965) work to find a homogeneous mathematical solution to measure surfaces expressed n different spatial units. His geographical scale is based on the decimal logarithm of the area of the Earth's surface divided by the area of the target portion of space. Our G-scale, is a generalisation of initial Haggett's proposal which can be applied to any kind of criteria defined at world scale (land area, population, GDP, CO_2, …). The transformation of initial count variables into G-Scale allows an immediate evaluation of the size of territorial units at world scale, immediate comparison of the size of a territorial units for different criteria, immediate building of objective typologies for size criteria, easy transformation of scale according to a hierarchy of levels, easy computation of standardised ratio and distribution indexes and finally, maybe an opportunity to distribute statistical results with the limited copyright problems.

- *Time scale (T-scale)*
As large systems are more stable through time than smaller one, the analysis of spatial trends at world scale should be based on longer time period. More it is easier to get long term databases at world scale, when the spatial unit in the State. This work on long term world databases will be useful to other ESPON TPGs as 3.2 (scenarios) and 3.3 (Lisbon Strategy). We propose a preliminary definition of time scale (T-scale) which offers simple rules for multi-scalar analysis of trends in time that could be use in future ESPON projects.

- *Political Scale (P-Scale)*

The political scale is defined by the functional capacity of territorial units to influence the evolution of the rest of the world that is mainly based on the geopolitical concept of power. It is different from the concept of political level (global, supranational, national, local). The different levels of political scale (P-Scale) can be adapted to different criteria (economic, demographic, social, cultural, environmental…). This P-scale is a useful tool for the analysis of the situation of Europe in the World but we have to be aware that this approach is not always relevant, in particular concerning some aspects of globalisation like transnational flows and networks.

A.4 Data situation

The other ESPON projects gathered a vast amount of data and indicators. However, it seems difficult to use them intensively in the framework of our project first because most of those indicators are related to small areas like NUTS2 or NUTS3 levels and are only available for ESPON or European Union space, second because of our will to study trends in long term perspective. As a consequence, specific structural and flows databases have to be built mainly based on international sources like UNCTAD, WDI, OECD, UN, but other relevant sources exist.

One important objective to the project is to harmonise the dataset in order to allow comparison of analyses, common use of the results in cross thematic questions and reproduction of statistical step in the future analyses. We first established a minimum list of territorial units that necessarily have to be covered by data collection according to political and geographical (based on G-Scale) criteria. All countries have at least one millionth of world population, world wealth and world area. For specific analyses, like European influence, we too determine a Euromed territorial unit set (82 countries). The ESPON space can be used to.

A.5 Map template and cartographic tools

An ESPON template is already available for all TPG. For the Europe in the World project we decide to build new maps templates, first to harmonise the maps between all our partners and second to provide the ESPON programme with World and pan-European maps templates.

- *World template*

Thoughts lead us to adopt a map projected in North Pole Azimuthal Equidistant with the centre of 90°N and 0°E. In that way none of the world economic centre is advantaged; the map can be used in any direction. The inconvenient is that the southern hemisphere is badly treated.

Figure 1 : example of the World template

POPULATION
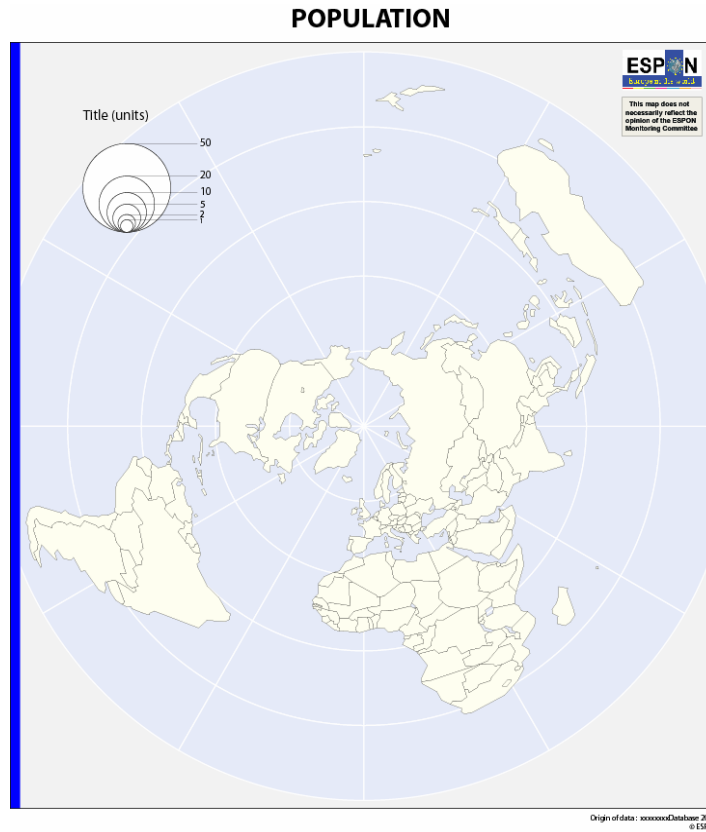
- *Pan-European template*

A pan-European template has been build too: map is projected in Lambert Azimuthal Equal Areas with the centre of 50°N and 18°E. We have chosen a relatively large definition of the European neighbourhood, both in eastern and southern direction, because at this stage of the research we are not able to define the limits of the most integrated part of European neighbourhood.

Figure 2 : Example of the Pan-european template

HOUSING SHORTAGE
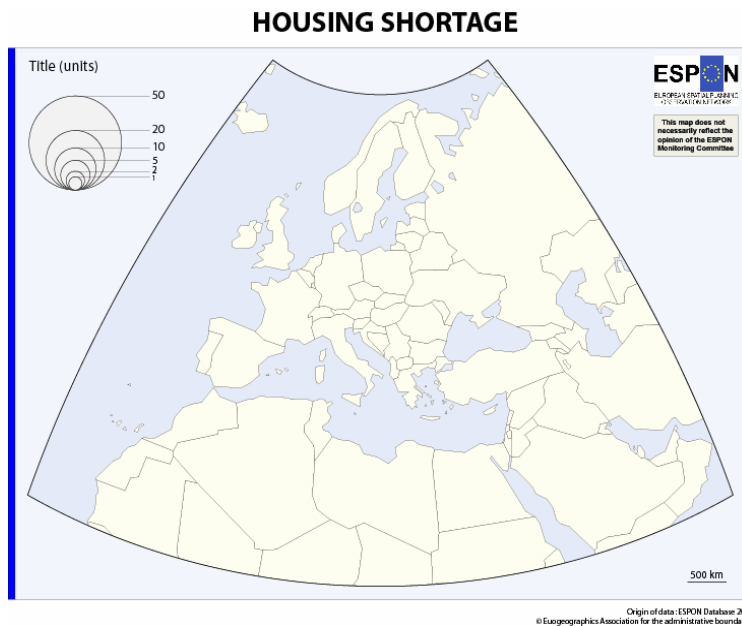
- *Cartographic chart*

Previous choices have been completed by colours and graphic representations for choropleth and proportional maps in order to build a systematic legend template which insure strong harmonisation of further production and opportunity to present coherent map collection at the end of the project.

A.6 Methodology for the analysis of flows and structures

The analysis of flows and structure should not be separated but strongly combined. Therefore, it is necessary to propose at an early stage of the project a coherent statistical framework for the analysis to be developed by core-teams specialised in each topic of interest (demography, economy, transport, environment) and to indicate how this sectorial results will be combined in the final outputs of the project. The dictionary of tools which is proposed for the integration of results is illustrated by simple examples of data analysis on a sample of flows and structure describing 7 countries from northern and southern bank of Mediterranea. The objective of this examples is to validate the proposed methods before to develop their systematic application on large scale databases.

A.7 Dictionary of concepts

A in the case of ESPON project 1.1.1. on polycentrism, we intend to develop a critical dictionary of concepts related to globalisation and situation of Europe in the world. The kick off-meeting of the project has led us to this elaboration of a dictionary of tools should be strongly related to the work packages on key-questions (for the selection of relevant concepts and the elaboration of their definition) and to the work package on case studies (for the illustration of each concept by empirical examples).

A.8 Case studies.

Still with the aim of harmonisation we proposed a template for case studies and the later have been group under the responsibility of a core team according to thematic or spatial specificities. In order to valorise the work of experts, the integral text of all cases studies will be gathered at the end of the final report in a specific annexe. Cases studies should have about 20 pages, including 14 pages of text and about 6 for maps, charts, tables and other illustrations. The first results of case studies will be presented in July at the internal meeting of the teams of Europe in the World project in Paris and will be added to the next interim report (December 2005).

A.9 Preliminary results on structure and flows.

The aim of this preliminary study is to explore basic exploratory tools related to cartography and statistical analysis and to propose a validation of the methodology which will be applied in the future. More, we used the concept of G-scale (for the choice of territorial unit) and time scale (by introduction a 5 years smoothing on figure of population and wealth). The analysis focus on the evolution is the share of the world population and share of the world GDP of states between half a century.

- *Demographic evolution of world states (1952-1998)*

The distribution of demographic size of States during the whole period is characterised by a strong concentration in a very limited number of States. The European territory is characterised by the lack of very large States and the great heterogeneity of demographic size, from very small to medium or large. The annual average growth rate of population of ESPON States during the period is clearly among the lowest at world scale.

Concerning the evolution of the share of the world, it is very clear that all States located in the ESPON territory are characterised by a dramatic reduction of their share of world population, but we can notice that it is also the case of Japan, Russia and China. This translation of the world gravity centre of population from north to south is a major feature with very important political and economical implications for Europe, especially if (as we will see in the next section) it is not followed by an equivalent translation of world economy.

A synthetic typology have then been done to take into account the specificity of the demographic evolution of each State with a cluster analysis which take into account all years of the period and not only the situation at beginning and end. It allows characterising:

- States that have a regular increase of population (Brazil, Mexico, Gulf countries, Central Asian countries, South Africa, Botswana and Algeria).
- States that have a global stability, that mean, a growth more or less equal to the world trend of the period (Australia, Canada, Argentina, India, China, Indonesia, Angola, Ethiopia, Chad and Argentina…).
- States that have a regular decline of their share of the world population, mainly due to their situation post demographic transition like United States, Russia, France, Japan, Sweden, Finland, Germany, Italy, Hungary, Austria, Czech Republic, Bulgaria, etc…

- *Demographic evolution of world states (1952-1998)*

The distribution of the economic size of States during the period 1952-1998 appears more stable than the evolution of demographic size. Concerning the evolution in absolute terms, we can notice the high level of heterogeneity of the variation of GDP PPPs both at world level and inside the subgroup of States belonging to the ESPON area. The most positive variation in the ESPON area are observed for Mediterranean countries like Spain, Portugal or Greece and the less favourable for UK, Switzerland and new member countries or candidate countries. Concerning the evolution in relative terms it is clear that most States located in the ESPON territory (except above mentioned Mediterranean countries and Ireland) are characterised by a more or less important reduction of their share of world GDP ppps.

As in the previous case of demography, the aim of this synthetic typology is to evaluate the specificity of the economic evolution of each State with a cluster analysis. The fact to take into account all years of the period 1952-1998 appears very important because the economic evolutions are more complex than the demographic ones. It allows noticing:

- States characterised by a very important increase of their economy during a first period (1950-1975) where their rate of increase of GDP is much higher than world trend (Libya, Saudi Arabia, Japan, Thailand, Tai-Wan, South Korea, Brazil, Mexico, Spain and Turkey…).
- States characterised by an inverse situation where the first period 1950-1975 was characterised by chaotic evolution of economy due to many political perturbations resulting in a rate of economic increase lower or equal to world trend. (China, Indonesia, Pakistan, Egypt, India, Vietnam, Chile).
- States characterised by the regular decline of their share in the world economy, whatever their initial situation of economic development. (France, Germany, Italy, Poland, Czech and Slovak republics, Hungary, Sweden…).
- States characterised by a relative stability of their world share of GDP until 1980 and a beginning of slow decline during the period 1980-1990 and, that is their particularity, an exceptional decline of their GDP between 1990 and 1998, due either to economic collapse (consequence of market liberalisation) or to political crisis (war). (Yugoslavia, Iraq, former republic of Soviet Union).

Map 1 : Evolution of the share of the World POP 1950-54 to 1996-2000

EVOLUTION of the SHARE of the WORLD POPULATION 1950-54 to 1996-2000

Map 2 : Evolution of the share of the World GDP 1950-54 to 1996-2000

EVOLUTION of the SHARE of the WORLD GDP 1950-54 to 1996-2000
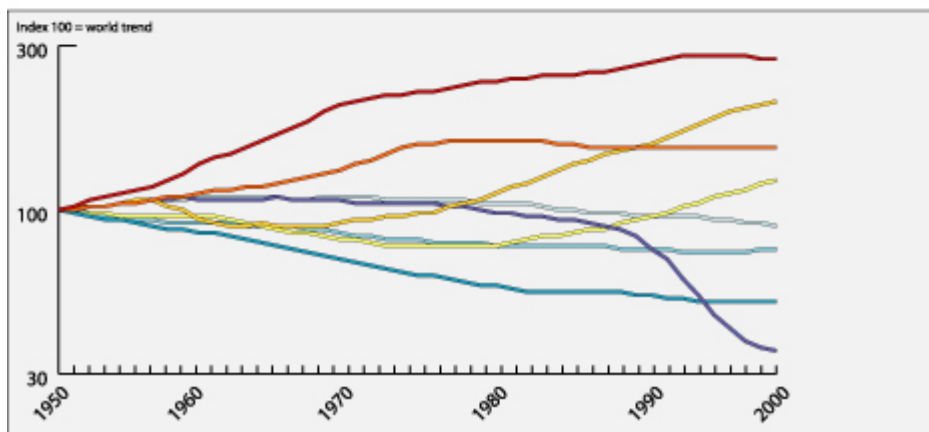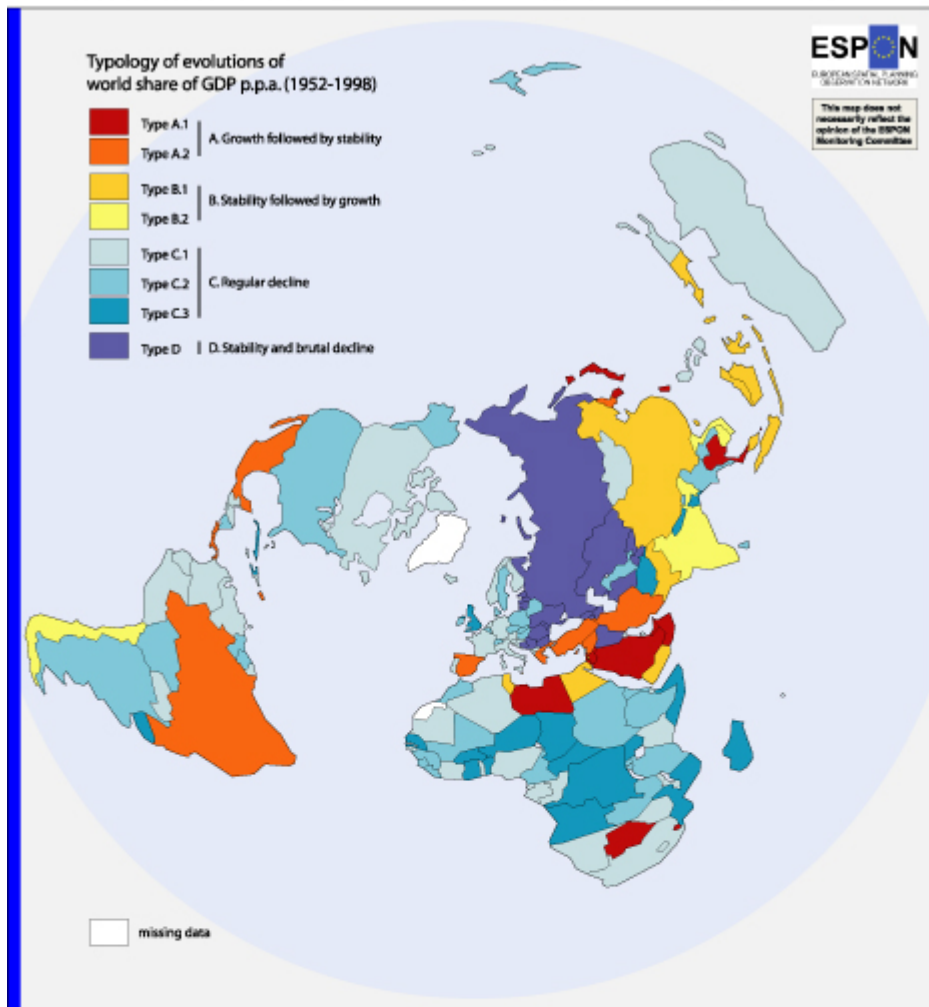
- *Synthetic typology of joint demographic and economic evolutions of world states (1952-1998)*

The separated analysis of demographic and economic dynamics did not take into account the joint effects of both criteria which combines at the same time the evolution of *social cohesion* (if we suppose that GDP/inh. is an approximate measure of the welfare of inhabitants) and the evolution of *economic attractiveness* (positive or negative evolution of GDP and population).

- States characterized by a positive divergence. The most favourable situation according to our criteria is the situation of States which has simultaneously increased their share of population and GDP at world scale but with a higher rate of increase for GDP than for population. Two kind of evolution can be notice: very strong economic growth associated with important demographic growth (Libya, Saudi Arabia, Qatar, Botswana, Southern Korea, Taiwan, Thailand, Israel), and very strong economic growth after 1975
- States characterized by a positive equilibrium. States which has experimented a significant growth of their share of world population and GDP but without advantage for one criterion. It means that the ratio of GDP/inh. of these States has more or less followed the world trend. This group associates States of large size (*Mexico, Brazil, Egypt, Turkey, Iran, Pakistan, Philippines or Malaysia*) with small and medium States (*Ecuador, Colombia, Algeria, Tunisia, Syria, Mongolia …*). It can be noticed than some countries of equatorial Africa are also member of this group (*Côte d'Ivoire, Kenya, Congo …*).
- States characterised by a "golden decline". They experience at the same time by a strong demographic decline and an increase or relative stability of GDP. We propose to call this very original situation "golden decline" because it characterises States where declining population are becoming more and more rich as compared to the world trend of GDP/inh. (Japan and European countries).
- States characterised by a negative equilibrium. This group defines States which has experimented a significant decline of their share of world population and GDP but without advantage for one criterion. It means that the ratio of GDP/inh. of these States has more or less followed the world trend as in the case of previous group B, but for opposite reasons. Accordingly, the States of this group D are and less and less attractive because the size of their market is decreasing demographically and economically at world scale. The States of this group are firstly *United States, United Kingdom* and former republics of soviet Union (*Russia, Ukraine, Belarus …*) and Warsaw Pact (*Poland, Hungary, Czech and Slovak republics…*).
- States characterised by a negative divergence. States from this group are characterised by the most critical situation which is an increase of their share of world population associated with a decrease of their share of world GDP, which implies that their GDP/inh. is growing smaller than world trend or eventually become negative.

A.10 Delimitation of world regions.

This text is a point of departure of these key question further analyses. From 1914 to 1991, the geopolitical scene was dominated by confrontation between blocks. The cold war prolonged until the eighties the splits that were dividing the humankind in hostile "worlds". With the decolonization the North/South division have been added to the East/West one. In April 1955, Bandoeng, marked the birth of a "third world". With the end of the cold war, one could think that there would be a shift from a plural world to a singular one. However, "civilisations" appeared to be resistant in the global context. Now, facing obvious signs of standardisation and an as much dynamic diversity, one does not know anymore how to divide the world. Economic regionalisation, geopolitics reorganisations and cultural resistances draw divisions that do not match and interfere with each other drawing a fragmented picture. As we do not know any more how to classify simply the places, we still divide the world in a way we consider as

neutral: the continents. This text and the different definitions of regions will serve as a theoretical base for statistical analysis.

A.11 Europe in its network

The Key question 2 "Europe in its networks" will focus on the analysis of networks, flows and cities that connect Europe to the rest of the world. Europe in its networks is a trans-scale approach, which does not introduce an assumption of contiguity (continuous territoriality) but an assumption of connexity (discontinuous territoriality). Its main objective is to illustrate how networks and flows shape the way that society relates to space in order to better highlight and understand the reorganization of world space and of European territorial structures. Three types of exchanges are taken into account. Each one corresponds to a strong dimension of globalization and provides an original image of the insertion of Europe in the world networks. Their comparison and combination will make it possible to give relevant and comprehensive indications on the various forms of territorial integration at different geographical scales.
The position of Europe in the world network will be first analysed through the international air flows that occur, in particular, between the cities . Second, the role of Europe in the world networks will be studied through trade flows and foreign direct investments flows. Third, we will analyse the way Europe have experienced the international migratory flows during the last twenty years.

A.12 European neighbourhood

The neighbourhoods of Europe are a quite recent preoccupation and an unknown area. Up till the beginning of the 2000 decade and the definition of what could be a European neighbouring policy ("ENP"), one can say that there was no clear representation of the countries which are surrounding UE. The European debates were focused on the geographic future enlargement of the Union. The announcement of an ENP in March 2003 was a significant step, but many uncertainties remain. Using the maps templates proposed in the cartographic part we have first to draw a precise picture of the current socio-demographic, economic and environmental situation of the neighbour countries, and then to measure the level of integration of this Euromed region.

First results of neighbourhood key question show:
- That the attraction of EU on the external trade of neighbour is obvious but unequal. (High in western parts of Northern Africa countries, East Mediterranean and Balkan and low in Near and Middle East and CIS countries. The map also shows a strong spatial discontinuity between North Africa and other African countries, which are less involved in the globalization process than the formers.
- That UE is an important commercial partner for Turkey and Russia. Concerning Russia, because of its enlargement in 2004, EU is now the first destination of Russian exports and a lot of European countries rely on Russia for energy supply. Concerning Turkey, the annual average increase of EU – Turkey trade in 2000-2004 has reached 9 % in value, while the increase of the total EU external trade with the world has reached only a 1,8 % over the same period.

A.13 Internal differentiation of the European territory according to globalisation

The geography of the European territories (EU29, Switzerland and Norway) in relation with the globalisation processes has to be defined from two different points of view. The first, the external one, has to define the place of Europe as a whole, but also the European regions versus the rest of the world.

Thus, we have to take as much as possible into account the specific geographical patterns of the links, relations and competitions of the different parts of Europe with the rest of the world. The second one, internal, takes into consideration more in depth the impacts of those links and processes on the European regions. As a hypothesis, we define *a priori* some types of regions, each type representing a different regional response to globalisation. These responses are obviously influenced by many different factors, and this typology presents a simplified view of these influences. The use of some key indicators will have to confirm these hypotheses, and possibly modify this typology. In a second step, the results will be confronted to the existing ESPON typologies, to examine how they fit and if they are pertinent or not regarding this matter.

On the basis of this typology (if confirmed) and other relevant ESPON typologies we will elaborate maps (analytical or synthetic/schematic) corresponding to the different themes covered in sectorial analysis and if possible a global cross-thematic map.

A.14 Preliminary proposals toward policy recommendations

We propose to derive policy recommendations from the results of the discussion on the four key questions presented in previous sections and it is only when we have made sufficient progress on the clarification of these key-questions that we will be in situation to propose relevant policy recommendations or – the terms seems better – policy orientations to the ESPON M.C. In this first interim report, we present the principles to be followed for the elaboration of policy recommendations with a specific focus on the question of scales (T-scale, G-Scale, P-Scale) and their consequences for political action. We illustrate these general principles with the example of first ideas of policy orientations related to European neighbourhood policy.

The Neighbourhoods question shows the utmost importance of the concept of (macro) region to understand political stakes and define efficient long term policies. Compared to wide range global flows ("archipelago" pattern: domination of multi-directional urban region-to-urban region links involving many European cities with no clear neighbouring impacts) and compared to strong connexions between Europe and the other regions of the Triad, this Euromediterreanean regional view might be increasingly relevant. Many authors emphasize the ongoing and potential role of the regionalism and especially what they call the "north-south regionalism" in the globalisation. If this assumption is true, it has many consequences for all European policies and not only for the single question of neighbourhood.

B ESPON IN THE WORLD
Toward a 4th dimension of European Spatial Planning?

B.1 INTRODUCTION

O wonder !
How many goodly creatures are there here !
How beauteous mankind is ! O brave new world
That has such people in 't !
W. Shakespeare (1612), The Tempest, V.1

In our answer to the tender ESPON 3.4.1, we noticed firstly that the essence of this ESPON project might be defined as "grounding globalisation". The concept of globalisation is fundamental to a study of Europe in the World, but globalisation takes many forms and the concept can become very loose and descriptive. ESPON, as a spatial planning observatory, is primarily concerned with the spatial forms that globalisation takes and the spatial strategies that are being developed within and outside Europe to take advantage of the opportunities created by globalisation while also addressing its risks. In this project, perhaps more than in any of the others, ESPON has to address the trans-scalar dimension – the connections between global structures and flows and their replication, impacts and policy initiatives at macro, meso and micro levels. It is important to recognise the complex nature of these trans-scalar relationships and the multi-directional nature of the flows and actions. Globalisation is a dynamic, differentiated, contested process infused with risk, not a one-way, top-down, controlled and predictable agency imprinting change on maps.

In a famous paper entitled "Story of the Blues"[1], two reporters from the Guardian had tried to follow the geographical path of production of a Lee Cooper LC10s that cost £19.95 at Cromwell's Madhouse in Ipswich in 2001. After a fascinating survey which lead them from Ipswich (UK) to Ras Jebel (Tunisia) and Saklo Agoume (Benin), the reporters identified a minimum number of 13 states having contributing to the production of the cloth sold in Ispwich and a much more important of elementary flows or connexions between firms of these countries. The reporters estimated that "*At a very rough, very conservative estimate, [this LC10s has realised] a journey of about 40,000 miles[2] on which components and raw materials criss-cross the globe in a sort of jerky, deranged dance*".

This example is a perfect illustration of the idea that the actual world is more and more complex and can not be analysed in a spatial framework restricted to European Union. In the production chain of the LC10s, 6 states of the ESPON area are included (France, UK, Germany, Hungary, Italy, Spain) but the main step of the production is realised in a neighbouring country (Tunisia) with important inputs from countries located all around the rest of the world (Turkey, Benin, Namibia, Pakistan, Australia, Japan, …). When European policy makers will have to take a decision on a subject like complete liberalisation of the international trade of textile and clothing, they should be aware that the consequences are not only sectorial and economical but also geographical. This geographical consequence has to be evaluated in different territorial frameworks (inside EU, in EU neighbourhood, in the rest of the world) and at different scales (national, regional, local). The recent political crisis between French president Jacques Chirac and European Commissioner D. Hubner about the question of industrial relocation inside/outside Europe is a

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[1] "Story of the blues", F. Abrams & J. Astill, The Guardian, Tuesday May 29, 2001
[2] About 65 000 kilometres.

typical evidence on the fact that the geographical effects of globalisation deserve a real political debate but that this debate should be based on an important scientific exploration.

This is probably an exceptional opportunity for the ESPON program to demonstrate that space does matter and that sectorial problems (trade, research, internal market …) are not independent and should necessary be analysed in their territorial dimension according to a systemic approach at different scales.

B.2 A SYSTEMIC APPROACH

A system is a big black box
Of which we can't unlock the locks
And all we can find about it
Is what goes out and what goes in.
K. Boulding (1956)

System analysis offers the global framework for the analysis to be developed on Europe in the World. The origin of system analysis is generally attributed to the seminal works of Shannon and Weaver on the *Mathematical theory of communication* (1945) and the theoretical framework proposed by K. Boulding (1956) and L. von Bertalannfy (1968) in the *General System Theory*. Since this pioneer period, a huge amount of literature has been developed on the applications of system theory in all fields of scientific activity. One of the most useful syntheses is the book *Systems and models* published by B. Wallisser (1977) which will be the basis of our presentation of system analysis applied to the situation of Europe in the world.

B.2.1 ELEMENTARY DEFINITION OF A SYSTEM

The most usual definition of a system is "a part of the universe, with a limited extension in space and time. Stronger or more correlations exist between one part of the system and another, than between this part of the system and parts outside of the system"[3]. This very general definition is not very useful because it can be applied to an infinite number of topics. Therefore we propose to use the more precise definition proposed by Wallisser (1977), which defines a system as "an entity with a relative level of autonomy, which can be separated from its external context, and which exchanges flows with its environment". In the case of a quasi-isolated system (Figure 3), the main properties are the following ones:

(1) The system is influenced by its environment but only according to defined processes which are called *inputs.*
(2) The system produces internal transformation of inputs (*throughputs*).
(3) The system exerts an influence on its environment, but only according to defined processes which are called *outputs*.

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[3] http://www.intelligent-systems.com.ar/intsyst/glossary.htm

Figure 3 : Quasi-isolated system

Source : B. Walliser (1977)
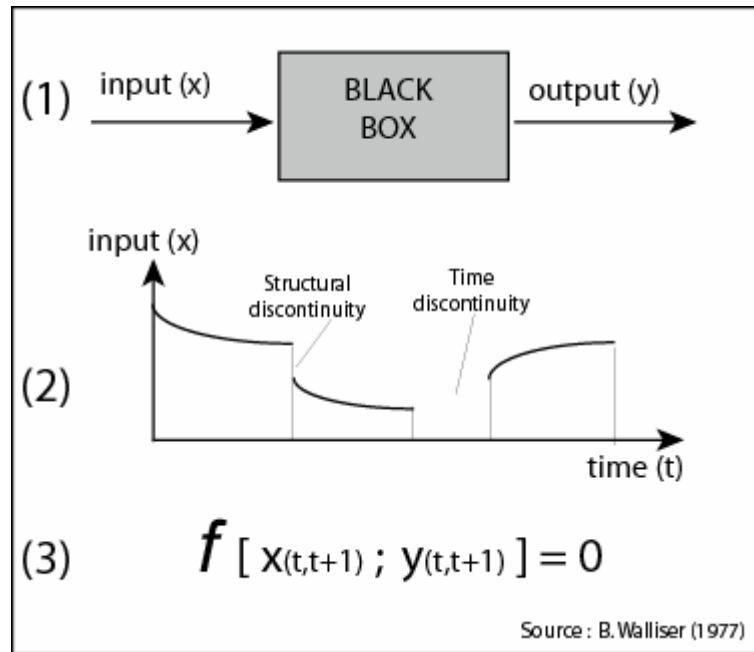
In this first approach, the problem is not to analyse the internal mechanisms of transformation which are unknown (black box) but only to build the response function which links inputs and outputs through time. The system is fully defined by the function f which links input and output and the problem is to analyse the properties of this function (continuity, trends, bifurcation…).

The interest of this very simple model is the fact that it can be applied at the same time in a great number of sectorial fields (economy, demography; information) and at various scales (local, regional, national, European, global). We can for example apply such model for the examination of the effects of R-D innovation (*input*) on productivity (*output*) at the national scale or for the measure of structural funds (*input*) on territorial cohesion (*output*) at the regional scale, or the effects of aid flows (*input*) on the achievement of millennium objectives (*output*) at the global scale, etc.

B.2.2 TYPES OF INPUT-OUTPUT

The theory of systems proposes to distinguish physical flows (*maintenance inputs or outputs)* and informational flows (*signal inputs or outputs*). Physical flows can furthermore be divided between *material* and *energetic* input-output, according to their nature (Figure 4).

Figure 4 : Input-output flows of a system

Source : B. Walliser (1977)
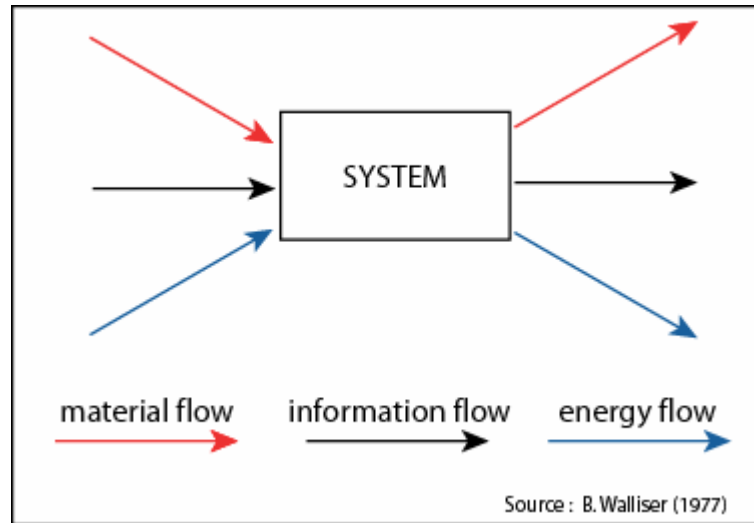
This fundamental distinction proposed by system theory can be easily applied to the analysis of globalisation. If we consider for example the recent evolution of the economic position of China in the world division of labour, we can show that the development of exportation of manufactured goods (*material output*) is related to a dramatic increase of importation of primary products (*material input*), oil (*energy inputs*) and technological knowledge (*information inputs*). It is also related to growing emission of carbon dioxyd (*energy output*) and new mental representation of China for the rest of the world (*information output*). The analysis of system suggests that one has to avoid separated analysis of isolated flows and indicates clearly that all types of input-output are clearly inter-related with potential positive or negative feed-backs or loops. For example, the fact that the bank of China buy each year billons of dollars to the central bank of United States contributes to support the internal demand of American citizens which buy Chinese products and contribute to the maintain of an exceptional growth rate of Chinese GDP and the regular increase of the debt of USA. In such example, the theory of system indicates clearly that the positive loop which links Chinese growth and American debt is not sustainable in a long term perspective, and that the most probable evolution is either a smooth decrease of interlinked flows (reduction of American deficit producing a reduction of external demand) or a brutal collapse of the system…

The different types of flows which will be analysed in the framework of the project ESPON 3.4.1 "Europe in the World" can not always be classified in a single category of system theory. The migration of people is typically a mixture of material, information and energy flows, according to the point of view which is adopted. The FDI are also difficult to classify as they are typically material flows but associated to the circulation of information (technological transfer). What is important for our research is to avoid a separated analysis of the different types of flows linking Europe with the rest of the world and to be able, at least in the last stage of the work, to propose a systemic view of interactions between the different categories of relations between Europe and the rest of the world.

B.2.3 ENVIRONMENT OF A SYSTEM

The environment of a system is that part of the universe that is in communication with the system, but is not part of the system. According to the existence of input and output flows between a given system and various area of its environment, it is possible to distinguish between three different situations (Figure 5).

Figure 5 : Environnent of a system

Source : Adapted from B. Walliser (1977)
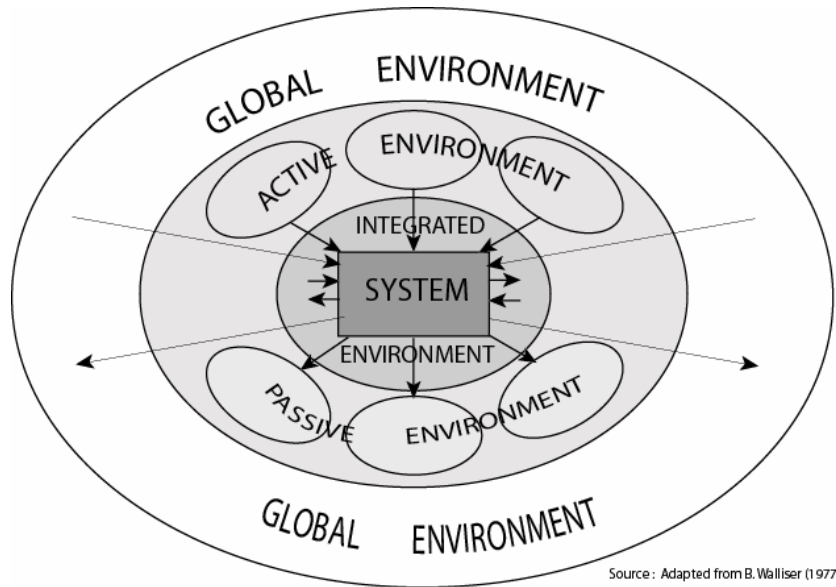
- *The integrated environment* of a system is a part of the rest of the universe which is at the same time influenced by and influent on the system.
- *The active environment* of a system is a part of the rest of the universe which exerts an influence on the system but is not influenced by it.
- *The passive environment* of a system is a part of the rest of the universe which is influenced by the system but has no influence on it

Another important distinction has to be made according to the level of input-output flows which connect a system to its environment:

- *The specific environment* is the part of the rest of the universe which can be considered as important for the analysis of a system, according to a given threshold of input and outputs.
- *The global environment is* all what can be theoretically connected to the system by input-output flows but can be practically neglected according to a given threshold.

The various theoretical concepts of environment proposed by Wallisser (1977) perfectly fit to the central problem of the project Europe in the World which is the definition of the influence of globalisation on the spatial organisation and future trends of European territory.

When we will develop a sectorial approach of the relations of ESPON countries with the rest of the world for different types of flows (trade, energy, air connexion, tourism), our central aim will be precisely to define the parts of the world which are part of the *integrated environment of* Europe (e.g. Northern America for trade flows), the parts of the world which are part of the active environment of Europe (e.g. Persian Gulf for energy flows) and the parts of the world which are part of the passive environment of Europe (e.g. Southern Mediterranean countries for tourism flows). And when we will try to integrate sectorial approach into a global model (see. previous section), we will precisely try to distinguish between the specific environment of Europe (i.e. Delimitation of European neighbourhood) and the global environment of relations with the rest of the World.

B.2.4 HIERARCHICAL ORGANISATION OF SYSTEMS AND SUB-SYSTEMS

The last contribution of system theory to the theoretical framework of the project "Europe in the world" is related to the concepts of sub-systems and levels of hierarchical organisation. To be more concrete in the explanation, we have adapted the theoretical figure proposed by Walliser (1977) to the specific case of the ESPON program (Figure 6).

Definition of the level of a system: If we consider the European Union (or the ESPON area) as a system, we can define the level of this system by a certain number of quantitative parameters (population, GDP, diplomatic influence) or qualitative parameters (international organisation of states, economic zone of integration, cultural area, …) which can be summarised in the general category of "World region". According to the criteria which have been introduced in the definition of the "world region of Europe", we can look for the existence of equivalent system at the same level, in order to examine the relations between these systems. If our criteria are mainly based on economic power, we will probably identify two other "World regions" at the same level: Northern America and Eastern Asia. If these systems are defined according to the same quantitative and qualitative criteria, it is possible to compare their characteristics (structural approach) and to analyse the input-output flows which link them together (functional approach). Eventually, we can add a fictive world region called "Rest of the world" in order to have a complete picture of the environment of each of the systems identified at this level.

Analysis of upper level system: When we consider the situation of European Union in the World, we introduce an upper level of analysis which is the global level of world which can be defined as a singular system (level 0) divided in various sub-systems. "World regions" are the first level (level 1) of division under the level of the world which summarizes their global environment.

Analysis of lower level systems: We can also consider European Union as a finite set of states which are the sub-system from the system of European Union and can therefore be considered as a second level of division of the world (level 2). States can also be considered as systems which can be divided in main administrative regions (level 3) which are the subsystems of states and can be divided in smaller regions or local authorities (level 4, 5, 6 …) until the final level of atomic social or economic units (individual, household, enterprise, …).

Figure 6 : Hierarchical organisation of system and sub-systems

Source : Adapted from B. Walliser (1977)
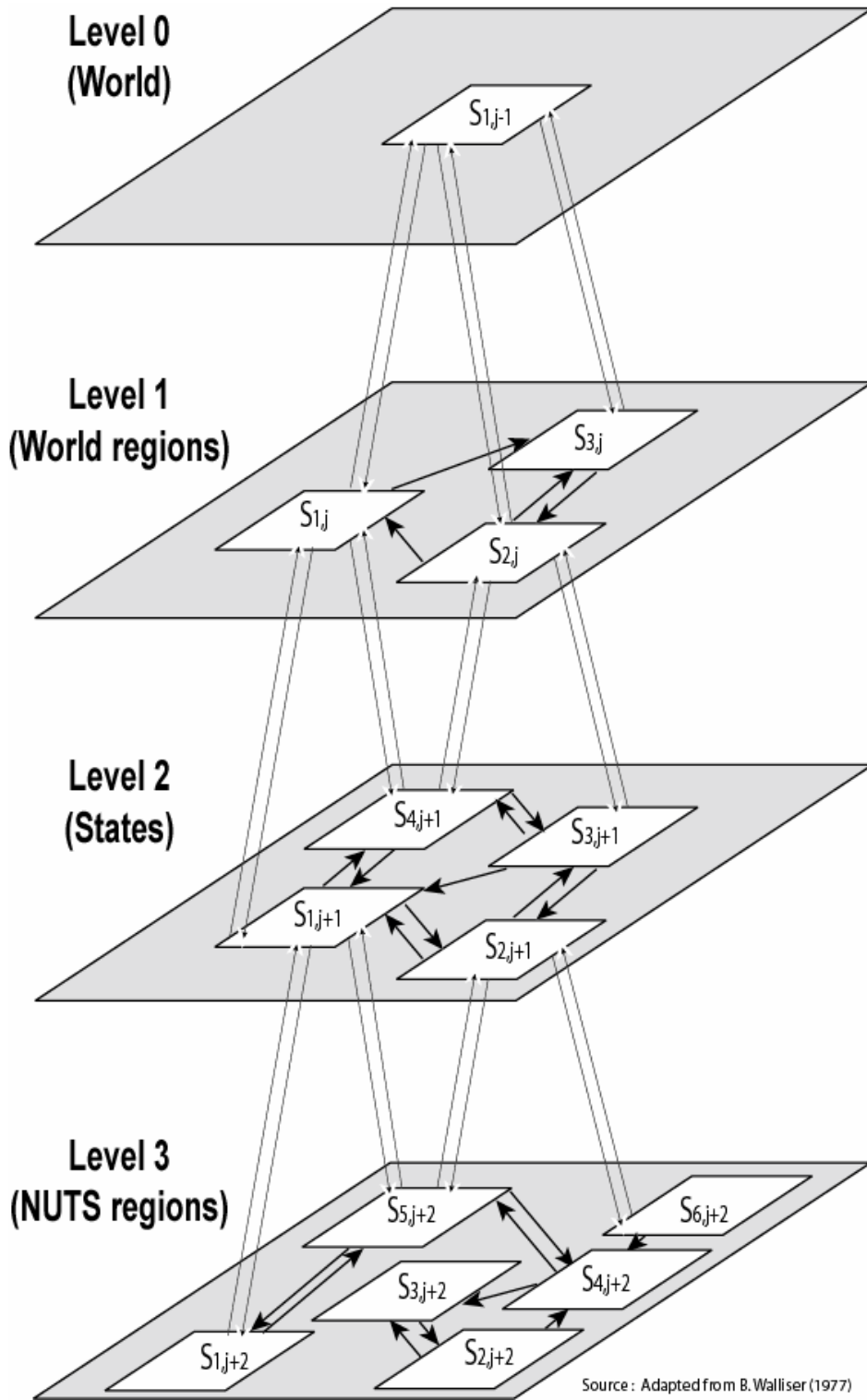
B.3 SCALE, SCALE, SCALE …

On se croit naturellement bien plus capable d'arriver au centre des choses que d'embrasser leur circonférence. L'étendue visible du monde nous surpasse visiblement ; mais comme c'est nous qui surpassons les petites choses, nous nous croyons plus capables de les posséder ; et cependant il ne faut pas moins de capacité pour aller jusqu'au néant que jusqu'au tout. [...]

Connaissons donc notre portée: nous sommes quelque chose et ne sommes pas tout. Ce que nous avons d'être nous dérobe la connaissance des premiers principes qui naissent du néant, et le peu que nous avons d'être nous cache la vue de l'infini.

B. Pascal (1671), *Les Pensées*, art. XVII, *Connaissance générale de l'homme*

System analysis offers a good theoretical framework for the analysis of the situation of Europe in the World but this general method has to be adapted to the specific problems of an analysis which has to focus on the territorial dimension of political action. The introduction of a fourth dimension in European Spatial Planning has many consequences which can be classified into four interrelated problems: geographical dimension, time dimension, thematic dimension and political dimension. This notion of "dimension" is indeed not very clear and can easily be confused with the systemic concepts of "sub-system" or "hierarchical level" which has been defined in previous section. To clarify the problem, we propose to introduce the concept of "scale" which is easier to formalise from mathematical point of view.

B.3.1 SCALES AND LEVELS

The geographical dimension is firstly analysed because it offers a clear and useful distinction between the notions of spatial scale and territorial levels. To illustrate this point, we have established a table which displays selected geographical, demographic and economic characteristics of heterogeneous territorial units (Table 1).

Table 1 : Basic information on selected territorial units in 1999

TERRITORIAL UNITS	Political Level	AREA km2	Pop. 1999 x. 1000	GDP 1999 x. Mio. $ pps
WORLD	Global	133 828 960	5 976 504	24 987 088
NAFTA	Supranational	21 557 900	409 059	8 994 767
Canada	National	9 970 610	30 957	664 021
Mexico	National	1 958 200	98 807	679 523
USA	National	9 629 090	279 295	7 651 223
UE15	Supranational	3 339 370	378 029	6 897 641
Germany	National	357 030	82 075	1 483 607
Netherlands	National	41 530	15 800	331 670
Greece	National	131 960	10 579	122 405
Luxembourg	National	3 000	433	14 595
Malta	National	300	390	4 356
France	National	647 300	60 825	1 196 613
Western France	Infranational	86 987	7 854	130 801
Bretagne	Infranational	27 811	2 937	48 526
Finistère	Infranational	6 882	860	14 773
Ile de France	Infranational	12 279	11 060	337 434
Hauts de Seine	Infranational	179	1 445	65 240
Paris	Local authority	108	2 144	120 643

Source: WDI, Eurostat, Maddisson database.

If we examine this table **from political point of view**, we can notice that territorial units belong to at least five different categories which are associated to different levels of analysis.

- *Global level (0)* is represented by a single territorial unit which is the world as a whole.
- *Supranational level (1)* is represented here by NAFTA and UE15 which are world regions based on group of states associated by treaties.
- *National level (2)* is represented by various states (Canada, Mexico, Germany, Malta, …) which are very different in size but display the same characteristics of political autonomy, existence of independent statistical system, etc.
- *Infranational level (3)* is represented by the various levels of administrative division of states according to national or supranational criteria. For example, France has official territorial divisions with partial autonomy and political representation (regions, departments, communes), but also technical divisions related to supranational organisation of European Union (definition of NUTS1 regions called ZEAT).
- *Local level (4)* is represented by Paris which is at the same time a regional division (from level NUTS 3) and a local authority (from level NUTS 5) defined as smallest level of administrative organisation or political representation.

If we examine the table from the **thematic point of view**, we can consider that the comparison of territorial units of the same political level is not necessarily relevant and that, in many cases, empirical comparison would be more relevant through a combination of territorial units of different political levels because the scales of territorial units are completely different.

- *From a geographical point of view*, does it really make sense to compare two states like Malta (300 km2) and Canada (9 970 610 km2) or two NUTS 3 regions like Hauts-de-Seine (179 km2) and Finistère (6882 km2)?
- *From a demographic point of view,* is it relevant to compare Luxembourg (0.4 millions of inhabitant) to Germany (82.1 millions of inhabitant) or is it better to decide – as done by Eurostat - that Luxembourg can also be described as a NUTS3 region which can be more easily compared to Finistère (0.9 millions of inhabitant) or Hauts-de-Seine (1.4 millions of inhabitants)?
- *From an economic point of view*, is it interesting to compare the Netherlands (332 billions of $ pps) to a small Mediterranean island like Malta (4 billions of $ pps) or a continental economy like United States of America (7651 billions of $ pps) and isn't it more interesting to establish comparison with another metropolitan area of comparable size like Ile-de-France (337 billions of $ pps), despite the fact that it does not belong to the same political level?

The answer to such questions is not obvious because, according to the target of the analysis, we can either decide to focus on political criteria or thematic criteria when we select the basic territorial units which will be the basis of the analysis. A thematic harmonisation of the territorial units presents many advantages for the description of spatial trends and helps to avoid many traps in the interpretation of results. But at the same time, the introduction of heterogeneous political levels makes the elaboration of policy recommendations more difficult because territorial units of different political levels have not the same degree of autonomy in political action.

B.3.2 GEOGRAPHICAL SCALE (G-SCALE)

The proper solution to the previous problem is not to oppose the political approach (levels) and the thematic approach (scales), but to find a coherent and clear way for their combination in the framework of ESPON project "Europe in the World". One important milestone for an objective approach is the concept of G-Scale proposed by Hagget (1965). When he introduced the concept of G-Scale, the initial idea of P. Haggett was to find an homogeneous mathematical solution for the measure of surfaces which was

expressed in different statistical units (spare kilometres, square miles, acres, hectares…). Therefore, the purpose of G-scale was to establish a universal measure of "**Geographical scale**" based on the decimal logarithm of the area of the Earth's surface divided by the area of the target portion of space according to equation (1)

$$G (AREA_i) = \log_{10} (AREA_{Earth}/ AREA_i) \qquad (1)$$

As an application of initial Hagget's proposal, we can try to evaluate the G-Scales value of the area covered by NAFTA (21.6 millions of km2). As the total area of the earth is approximately equal to 510.1 millions of km2 (including both land and oceans), NAFTA represents 21.6/510.1= 4.22% of earth surface which correspond to **G=1.37**. In the case of Mexico (1.96 millions of km2), the share of earth surface is only 0.38% which corresponds to **G=2.41**. At first glance, these figures seem rather abstract, especially because of logarithmic transformation, but they offer very interesting properties:

- *The G-scale is based on a natural referential* (the whole Earth surface) which is equal to the reference value **G= 0**
- *The interpretation of the values of G is very easy* if we notice that they are related to the power of 10: **G=1** represents 10%, **G=2** represents 1%, **G=3** represents 0.1 %, etc…
- *The change of a referential to another one is obtained by simple difference of the value of G*. For example, if we want to compare the area of Mexico's to the referential of NAFTA, we just have to subtract their respective G-values: **2.47-1.31 = 1.13** which indicates immediately that the area of Mexico is more or less equal to 10% of the area of NAFTA.

Of course, we can also address some criticism to Haggett's initial proposal and propose some adaptation. For example, we can estimate that the good referential for the estimation of the surface of NAFTA is not the whole area of the Earth but only the land area (148.8 billions of km2) without oceans (361.3 millions of km2). In this case, NAFTA represents 14.5% of the land areas and obtains a better score with **G= 0.84**. We could also develop a more political approach and decide to exclude Antarctica from the definition of land area, because it is a common property of mankind and not the property of a given sovereign states. In this case, the "political area" of the World is reduced to 133.8 millions of km2, from which NAFTA represents 16.1% with a value **G=0.79**.

The reader has probably noticed that in the last proposed measure of the scale of NAFTA, we have replaced the term "**Earth**" by the term "**World**". Indeed, the term "Earth" is related to the natural subsystem of Universe which is our Blue Planet whereas "World" is related to the global system of mankind which, as far as we know, is not included actually in a social system of upper level. This crucial distinction between Earth (natural system) and World (social system) leads us to propose another version of Hagget's scale which will keep the initial name of G-Scale but with another meaning where G will be the abbreviation of **"Global"** and not **"Geographical"**. This new version of Hagget's scale can now be applied to any kind of phenomena distributed across the world, not only area but also population, wealth, water resources, carbon dioxide emission, etc… Each phenomena which is defined as a raw count variable (X) can indeed be measured on the Global scale of the World according to equation (2):

$$G_{World} (X_i) = \log_{10} (X_{World}/ X_i) \qquad (2)$$

As an example, we have transformed all initial information of table 1 into their equivalent on the Global Scale of the World (Table 2).

Table 2 : Example of G-Scale transformation

TERRITORIAL UNITS	% World			G-scale		
	AREA	POP	GDP	AREA	POP	GDP
WORLD	100%	100%	100%	**0**	**0**	**0**
NAFTA	16.11%	6.84%	36.00%	**0.79**	**1.16**	**0.44**
Canada	7.45%	0.52%	2.66%	**1.13**	**2.29**	**1.58**
Mexico	1.46%	1.65%	2.72%	**1.83**	**1.78**	**1.57**
USA	7.20%	4.67%	30.62%	**1.14**	**1.33**	**0.51**
UE15	2.50%	6.33%	27.60%	**1.60**	**1.20**	**0.56**
Germany	0.27%	1.37%	5.94%	**2.57**	**1.86**	**1.23**
Netherlands	0.03%	0.26%	1.33%	**3.51**	**2.58**	**1.88**
Greece	0.10%	0.18%	0.49%	**3.01**	**2.75**	**2.31**
Luxembourg	0.00%	0.01%	0.06%	**4.65**	**4.14**	**3.23**
Cyprus	0.00%	0.01%	0.02%	**5.65**	**4.19**	**3.76**
France	0.48%	1.02%	4.79%	**2.32**	**1.99**	**1.32**
Western France	0.06%	0.13%	0.52%	**3.19**	**2.88**	**2.28**
Bretagne	0.02%	0.05%	0.19%	**3.68**	**3.31**	**2.71**
Finistère	0.01%	0.01%	0.06%	**4.29**	**3.84**	**3.23**
Ile de France	0.01%	0.19%	1.35%	**4.04**	**2.73**	**1.87**
Hauts de Seine	0.00%	0.04%	0.48%	**6.09**	**3.45**	**2.32**
Paris	0.00%	0.02%	0.26%	**5.87**	**3.62**	**2.58**

The comparison of table 1 and table 2 proves that the transformation of initial information into standardised value (share of the world and Global World Scale) presents many advantages for the analysis to be developed in the project Europe in the World:

- *Immediate evaluation of the size of territorial units at the world scale*: with table 1, it was not easy to define the size of a territorial unit at the world scale and the reader was obliged to make really complicated arithmetic operations to perform this evaluation. For example, the demographic size of Netherlands (15.8 millions of inhabitants) had to be compared to the world population (6 billions of inhabitant) when the results is immediately obtained in Table 2 (0.26 % of world population, G=2.58).
- *Immediate comparison of the size of a territorial units for different criteria*: with table 1, it was not easy to compare the geographic, demographic and economic size of territorial units at the world scale, because they were measured in different units (km2, inhabitants, $ pps) and the total sum of the World was not the same. With table 2, we can see immediately that the size of France dramatically varies according to the criteria and is the most important for economy (4.8% / G=1.32), then demography (1.02% / G=1.99), then geographical area (0.48% / G=2.32).
- *Immediate building of objective typologies for size criteria*: due to the standardisation of criteria and the proprieties of logarithmic scale, it is very easy to build typologies according to size criteria when using G-Scale. We can for example consider as "**Very Large**" the units situated between 10% and 100% of the World (G comprise between 0 and 1), as "**Large**" the units between 1% and 10 % of the World (G comprise between 1 and 2), as "**Medium**" the units between 0.1% and 1% of the World (G comprise between 2 and 3), as "**Small**" the units between 0.01% and 0.1% of the World (G comprise between 3 and 4) and finally as "**Very small**" the units under 0.01% of the world (G lower than 4) and can be neglected in the analysis as their contribution to the result is less than 1/10 000e of the target phenomena. The fact that the size of a unit is decreasing when the value of G increase appears at first glance something difficult for the reader. But we can notice that the form of scale is in fact consistent with the notion of "level" which has been presented in previous section. G scale is also consistent with natural language when we say, for example, that

from a demographic point of view USA is a state of "first level" (G≈1), France "second level" state (G≈2) and Greece a "third level" state (G≈3).

- *Easy transformation of scale according to a hierarchy of levels*: As noticed previously about initial formulation of Haggett's scale, it is easy to change the referential of any measure based on G-scale by simple computation of arithmetic differences between the G-scale of a territorial and the G-scale of any territorial unit of upper level. For example, the demographic size of Paris is "Small" at the world scale (G_{World}= **3.62**), but "Medium" at the EU15 scale (G_{EU15} = 3.62-1.20 = **2.42**), "Large" at the national scale (G_{France} = 3.62-1.99 = **1.63**) and "Very Large" at the regional scale ($G_{Ile\ de\ France}$= 3.62 – 2.73 = **0.89**).

- *Easy computation of standardised ratio and distribution indexes*: Last but not least, the normalisation of raw count variables according to the world total makes very easy the computation of all derived ratio and all related indexes of unequal economic allocation of resources to population or unequal geographic distribution of population. For example, the fact that USA represents 4.7% of world population and 30.6% of world GDP (pps) indicates immediately that their GDP (pps) *per* inhabitant is equal to (30.6/4.7) = 6.6 times higher than the average value of GDP/inh of the world. We can also immediately deduce that their population density is a bit lower than world population density because the ratio of their share of population and area is equal to (4.6/7.2) = 0.65.

- *Opportunity to distribute statistical results with limited copyright problems?*: The fact that we do not use initial raw count variables or ratio but share of world population and standardised index could be an opportunity to distribute the results of ESPON project "Europe in the World" without being obliged to face a huge number of copyright. It is a point to check from a legal point of view, but if the transformation or raw count variables into share of the world and G-scale can be considered as an intellectual added value, ESPON can probably be allowed to distribute more easily related tables and maps[4].

B.3.3 TIME SCALE (T-SCALE)

The previous proposals on geographical scale of analysis of phenomena (G-Scale) is not independent from another discussion related to the choice of time scale (T-Scale) to be chosen in the analysis about the situation of Europe in the World. The link between space and time scales is related to the general empirical rule according to which systems of large size offers a higher level of stability through time than systems of smaller size. There are of course many exceptions to this heuristic observation but it remains generally true and suggests that the analysis of spatial trends at the world scale should necessary be based on longer time periods than other analysis realised at regional scale in the framework of the ESPON program.

Another argument in favour of the use of longer time scales in the framework of project ESPON 3.4.1 is the fact that it is easier to obtain long term time-series when basic territorial units are states than when it is NUTS2 or NUTS3 regions. During the last lead partner meeting of the ESPON project (March 2005), the panel group on ESPON core indicators noticed that only 4 indicators on an amount of 110 was dynamics, 2 of them related to past trends and 2 others to estimated future trends. This strong limitation of dynamic indicators is obviously related to the difficulty to elaborate complete statistical databases at NUTS2 or NUTS 3 levels for the 29 different states of the ESPON project and also to the many changes of administrative territorial divisions which took place in Europe during the period 1989-1995 (see. SIR of ESPON Project 3.2 on long term database). But it is a crucial problem for a spatial planning program like ESPON which can not elaborate long or mid-term scenarios without information on past trends.

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[4] G-Scale transformation can be considered as a very basic system of cryptography. For example, the G-scale value of the population of USA in 1999 (1.16) is the encrypted value of the real figure of population (279.3 millions of inhabitant) through the application of the cryptographic formula $G(X) = \log_{10} (Key/X)$, where the key of the code is the total population of the world in 1999 (5976.5 millions of inhabitants). Without this key value, it is not possible to obtain the real figure which was in the initial database. The legal problem is to evaluate if the cryptographic system is sufficient to protect initial information and if the added value of the G-scale transformation is sufficient to consider that it is an intellectual creation.

Even if the spatial resolution is lower, the database elaborated by the ESPON project 3.4.1 should enlarge the time focus to longer period in past (1960-2000) and future (2000-2030) in order to provide this information to other ESPON TPG, especially project 3.2 which has to elaborate a long term database for the quantitative evolution of political scenarios. The time series elaborated at the state level by ESPON 3.4.1 will indeed be transformed into regional estimations according to various procedures of desegregation. But in the case of other projects like ESPON 3.3. Lisbon Strategy, the time series elaborated at state level by ESPON 3.4.1 can also contribute to the development of a historical perspective of benchmarking of economic growth and competitiveness between Europe and other parts of the World.

The introduction of a historical perspective for the analysis of the situation of Europe in the World is something which can dramatically modify the approach of European Spatial Planning because it implies a multiscalar evolution of trends not only in space but also in time. To illustrate this notion of time scale, we propose, as we have done for G-Scale, to analyse an empirical example which is the comparison of economic and demographic trends in southern and eastern neighbourhood of Europe (Figure 7 and Table 3)

Table 3 : Economic and demographic trends in SE Mediterranean and East Central Europe according to various time-scales

T-scale			South and East Mediterranea		East Central Europe	
			Pop	GDP	Pop	GDP
0	Very Short	1999/2000	1.8%	5.1%	-0.2%	4.4%
1	Short	1993*/1998*	2.0%	4.2%	-0.3%	-0.2%
2	Medium	1988*/1998*	2.2%	3.8%	0.0%	-3.0%
3	Long	1978*/1998*	2.4%	3.9%	0.2%	-0.9%
4	Very Long	1958*/1998*	2.5%	4.9%	0.6%	1.7%

(*) indicate five year mean. For example, 1993* is the mean value of the period 1991-1995
    Source: Maddisson database.

The aim of this example is not to discuss the interest of a benchmarking between eastern and southern part of the western European neighbourhood but to introduce the interest of a multiscalar analysis of trends in time and to propose simple rules for the definition of T-scale in future research of project developed by ESPON project "Europe in the World".

- *Very short term evolution (T-scale=0)* will be defined as all trends which are based on a time span lower than 5 years. Between 1999 and 2000 the countries of East Central Europe (ECO) have a rate of economic growth which is very high and approximately equivalent to that of countries of South and East Mediterranea (SEM). But this information is of low interest because it is based on the evolution of a single year.
- *Short term evolution (T-Scale=1)* is related to evolutions observed on a period of 5 years [5] which can be considered as the minimum period of time for the observation of significant trends at world scale. According to this criteria, we can say that countries from SEM have experimented positive trends from a demographic (+2.0 %/year) and economic point of view (+4.0%/year) over the recent period, when countries from ECO were characterised by slightly negative rates on both criteria (-0.3% and -0.2% / year
- *Medium term evolution (T-scale=2)* is related to evolution on a period of 10-15 years. They are related to more structural evolution and, in the case of ECO, this time scale characterises typically the evolution since the fall of the iron curtain in 1989. The change of T-Scale has little effect on the measure of trends in SEM countries but produce an important change in the appreciation of economic trends in East Central Europe which appears very negative (-3.0%) when they were just slightly negative in a short term (-0.2%) and highly positive (+4.4%) in a very short term.

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[5] Which means not only the evolution between two different years separated by 5 years (1995/2000) but the evolution between two period of five years (1991-1995 and 1996-2000) for which we have computed the average value before calculating the mean (average?) rate of evolution (1993*/1998*). We could also use a regression model of linear (X=a.t+b) or exponential (logX=exp(a.t+b)) form for the estimation of trends at various time-scales.

- *Long term evolution (T-Scale=3)* is related to evolution on a period of 20-25 years, which begins to be mainly related to structural factors but can be influenced by cyclic factors. At this scale of time, the situation of countries from ECO is not as negative as previously, at least from a demographic point of view (+0.2%/year).
- *Very long term evolution (T-Scale=4)* is related to evolutions observed on a period of 40-50 years which is in fact very short from a historical point of view but can be considered as the maximum time for most political decisions. In our example, it is clear that the economic and demographic growth of SEM countries has been much higher than that of ECO countries during the last 50 years. In 1950, the population and economic size of SEM countries was 50% of the size of ECO countries, but they have become equal for both criteria at the beginning of the 1990's and we can suppose that the situation will be reversed around 2020-2030.

Figure 7 : Comparative demographic and economic evolution of countries from South and East Mediterranean and East Central Europe

(a) Population 1950-2000
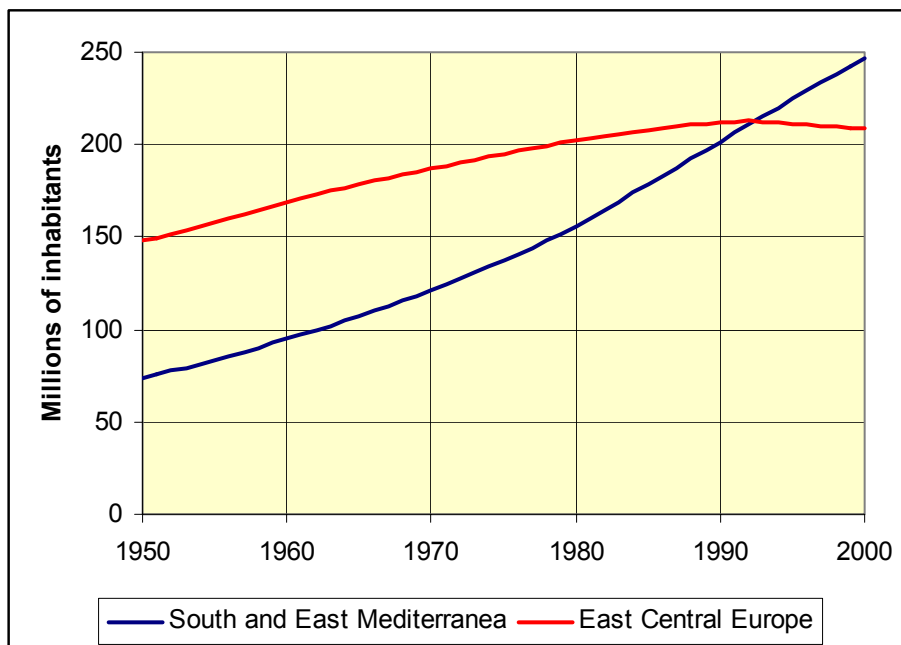
(b) GDP (pps) 1950-2000
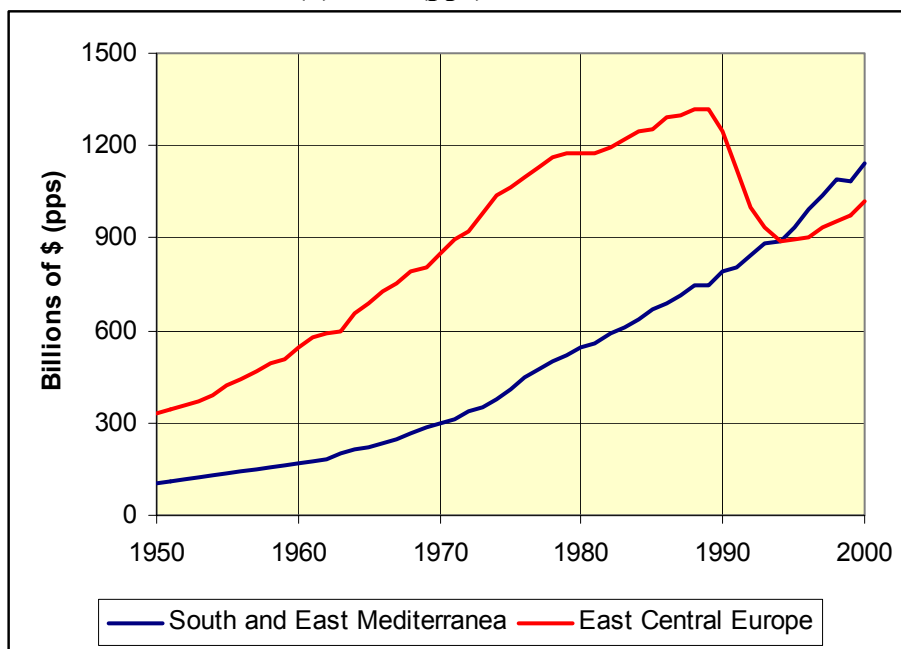
Source: Maddisson database

East Central Europe: Albania, Armenia, Azerbaijan, Bulgaria, Bosnia, Belarus, Czech Republic, Estonia, Georgia, Croatia, Hungary, Lithuania, Moldova, Macedonia, Poland, Romania, Serbia/Montenegro, Slovakia, Slovenia, Ukraine.
South and East Mediterranea: Cyprus, Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Latvia, Malta, Syria, Tunisia, Turkey, Morocco, West Bank &Gaza stripe.

B.3.4 POLITICAL LEVELS (P-LEVELS) AND POLITICAL SCALE (P-SCALE)

The previous technical discussion on G-Scale and T-Scale was necessary to define the ground basis of political scales (P-scale) to be used in the framework of project Europe in the World for the elaboration of the 4th dimension of political action. As explained in the beginning of this section, we have to face a difficult problem of definition in order to distinguish between political levels and political scales. Political levels can be defined as a hierarchy of systems and subsystems with alternative clear and unclear territorial definitions (Table 4).

Table 4 : Definition of political levels

POLITICAL LEVELS	BASIC TERRITORIAL UNITS	EXAMPLES	SPATIAL DEFINITION
0	World	World	Clear (at least for land areas but not necessary for oceans)
1	World regions	NAFTA, Western Europe, EU25, ESPON29, Asia, …	Unclear (cross-cuting divisions according to criteria)
2	States	USA, Germany, Liechtenstein, Southern Korea, ...	Clear (with some exceptions like Western Sahara, Tai-Wan)
3	Administrative regions & Metropolitan areas	Bayern, Arkansas, Basel-Stadt, Wallonia, Greater London, ...	Unclear (because various possible levels of administrative divisions)
4	Local authority	London, Ixelles, Paris, Sucy-en Brie,…	Rather Clear (when defined on an administrative basis)
5	Local neighbourhood	Paris XIIIe, Manhattan, Ramblas, Mala Strana , ...	Unclear (not necessary based on fixed administrative division,)

The clearest definitions are related to political levels 0, 2 and 4. The level of the World (0) is the global level of political organisation of mankind considered as a whole. Local authority (4) can be defined in a symmetric way as the first level of political organisation. State level (2) is the central level of political organisation which defines the system of international relation. But between each of this relatively clear levels of political organisation, we can find an intermediate system (1,3,5) which has gained growing importance over the last twenty years but without clear definition in most cases. In the case of world regions (1), the problem relies on the great variety of criteria that can be employed for the divisions of regions (juridical, economical, demographical, mental maps, flows, …), producing cross-cutting divisions of the world without clear solutions for the definition of a "best partition" (see Key Question 1). In the case of administrative regions (4), the problem is not related to the fact that administrative division are fuzzy but to the fact that there is a great number of regional divisions in each state according to geographical scale and to functional criteria. The administrative division of each state are the result of national culture and history, which means that they are generally not comparable from one state to another (Cf. the MAUP problem for NUTS2/NUTS3 divisions in Europe). Another problem is related to the fact that towns which are major functional realities generally do not fit perfectly to administrative units. In the case of local neighbourhood (5) the problem is related to the fact that social groups have various representations, various mental maps of the place where they live which can not necessary be taken into account by local administrative authorities. But at the same time, these local neighbourhoods (*"my street", "mon quartier")* are perceived as a major reality by citizens and are often the crucial level of democratic organisation of society.

The notion of political scale is different from the notion of political level because political scale is not based on the political definition of territorial units but on their functional capacity to influence the

evolution of the rest of the World. The political level can contribute to the definition of the political scale (e.g. an increase political integration of European Union can increase its capacity of action at world scale) but the notions are fundamentally different. The definition of political scale (P-Scale) is clearly related to the previous defined geographical scale and time scale, which can be illustrated by a draft version of political scales presented in Table 5.

Table 5 : Draft version of political scales

Political scale	Power level	Exemple	G-scale	T-scale
0	Global	USA (?)	0.5<	> 4
1	Macro-regional	EU25, Japan-China	0.5 to 1	> 3
2	Regional	Russia, India	1 to 1.5	> 2
3	Micro-regional	Sweden, Benelux	> 1.5	variable

As a very preliminary proposal, we propose to distinguish between 4 different levels of political scale, which are presented here in a general way but should be adapted to different criteria (economic, demographic, environmental, social, cultural …) with different results in terms of classification of territorial units.

- *Global political scale (0)* characterises states or international organisation which have the power to influence the evolution of the rest of the World and which are subject to no limitations in their political decisions. This situation implies a situation of global domination (G-Scale) for a set of criteria which corresponds to an important share of world resources for these criteria. In practical terms, a share of 30% of the world resources (G<0.5) is generally sufficient if any other potential challenger has a share of resource greater than 10-15%. This situation is actually typically observed for the United States for a great number of criteria (economy, military power, cultural influence …). From the point of view of time, the global domination implies the development of long term strategies on at least half a century (T-scale > 4) both for the establishment of the global power and for its reproduction in the future. Once more, the situation of the United States is typical with very powerful think-thanks (private or public) which provide analysis, visions and scenarios for the realisation of long term objectives.

- *Macroregional political scale (1)* characterises states or international organisations which can influence the evolution of the rest of the world but at a less degree than before and with a higher level of dependency to the evolutions observed in the rest of the world. In territorial terms, this situation is generally associated to a dominant influence on a limited part of the world and a less important capacity of actions in the rest of the world. European Union on the one hand, China and Japan on the other hands are typically representative of this category of political scale. But with the important difference that European Union is an emerging political level when China and Japan are rather engaged in a competition for political and economic domination in eastern Asia. In both cases, the G-Scale is comprised between 0.5 and 1.0, which means that these entities account for 10 to 30% of world share on several criteria. In terms of T-Scale, the strategies developed by these entities are generally shorter 20-25 years but are based on important administrative bodies (European Commission, Japan minister of industry and economy …) linked with research institutes and expert groups.

- *Regional political scale (2)* corresponds to a lower level of states or international organisations which is submitted to world trends and has a limited influence on them or only for certain criteria or functions. Their territorial influence is generally limited to the states with which they have common border but which can represent an important part of the world in geographic or demographic terms. Good examples of this situation are provided by India, Russia and Brazil, but with very different situations according to the nature of their relations with neighbouring states (conflict, common history, economic treaties …). Once more, the political scale defines potentialities which are more or less used and can be negatively or positively influenced by the evolution of political levels. The G-Scale of regional political construction is limited from 3 to

10% of the world share and the associated T-Scale is limited to evolutions which are generally not planned or predictable on time periods greater than 10 years.

- *Micro-regional political scale (3)* can be applied to the case of states or international organisations of large to medium size but which benefit from the lack of powerful challengers in their immediate neighbourhood, which offers them a local area of influence. The regional influence of Sweden in the Baltic Sea, or Vietnam in former colonial region of Indochina, are good examples of such situation. In both cases, the micro-regional area of political influence is included in a wider political area at regional or macro-regional scale which indicates that they can be analysed as sub-systems more or less integrated to systems of upper level. The G-Scale of such micro-regional political organisation can be very different but does not represent generally more than 3% of world share. In terms of T-scale, the situation is not simple because such micro-regional construction can be very solid and based on long term period of historical existence. The fact that micro-regional scale is based on relations between a limited number of states can make easier a strong integration, as in the case of Benelux which still exists as an important political reality inside the European Union. We can assume that a good knowledge of the micro-regional political scale is a crucial topic for the understanding of political constructions of upper level to which they provide elementary bricks.

The definition of a political scale is a useful tool for the analysis of the situation of Europe in the World and for the analysis of the consequences of globalisation on the development of the European territory. But we have to be aware that this very hierarchical approach of international relations (mainly based on the geopolitical concept of power) is not always relevant and that many other aspects of globalisation are based on transnational flows and networks which can not be captured by these classical concepts. For example, transnational firms developed territorial strategies which are not necessary the same than those of states or international political organisations to which they belong originally and in many cases it is difficult to define their nationality. The economic size of biggest world firms can be equivalent to the size of states of medium and large size (G-Scale between 2 and 3) but their strategies are often developed on shorter periods of time (T-scale lower than 2) and they can introduce a very high level of uncertainty in spatial planning. The same is true for World Cities like New-York, London or Tokyo which are parts of a global network of communication which is partly independent from the political territorial division of the world and can not be analysed through the classical geopolitical grid of levels of power. World is definitively complicated …

B.4 CONCLUSION

Is this the Region, this the Soil, the Clime,
Said then the lost Arch Angel, this the seat
That we must change for Heav'n [...]
                                   Hail horrours, hail
Infernal world, and thou profoundest Hell
Receive thy new Possessor: One who brings
A mind not to be chang'd by Place and Time

J. Milton (1674), *Paradise Lost*, I, 242-254

Some reader of this introduction to the first interim report of ESPON project "Europe in the World" has probably been disappointed by the huge number of theoretical and methodological considerations which has been introduced as preliminary to the research. But the clarification of concepts and tools is, in the author's opinion, the necessary condition for the development of good empirical results related to relevant policy recommendations. The introduction of a fourth dimension in the actual practice of European Spatial Planners is not a trivial question and it is necessary to obtain a good agreement on concepts and methods, from both scientific and political points of view, before to develop intensive research on the subject. The time which is apparently wasted on theoretical boring consideration can be in fact a gain for future research in a longer term perspective like the one of ESPON II (T-Scale > 1 ....).

As a form of apologize to the reader which accepted to follow the authors in this difficult introduction to the project, we propose a simple political application which, we hope, demonstrates the interest of the way we propose to follow in future development of project 3.4.1. We have chosen for this the example of the application of Kyoto's protocol on the reduction of carbon dioxide emission.

The classical approach of the problem is the *international* approach which is based on the negotiation between independent states which agree or disagree to sign the protocol of Kyoto, with a minimum number of states requested for the application of the international treaty. As we can see on Figure 8, it is possible and interesting to transpose at world scale the multiscalar territorial approach which was used in the ESPON program for the analysis of regional situations. The basic territorial level of analysis is the distribution of world population and CO_2 emission by states (*Figure 6-c*) where we can easily compare the share for both criteria (application of G-Scale). According to the fact that CO_2 emission are not limited to the territory of a given states but produce a global change of the climate of the earth, it is logical to consider that it is a common responsibility and that, in a situation of international justice, each state should not produce a share of CO_2 greater than its share of population without prejudice for the rest of mankind. From this point of view, the map indicates clearly that all states of the ESPON area in a situation of excess of CO_2 emission according to their population[6]. At this level of analysis, it is very difficult to obtain an international consensus, especially if we take into account the historical dimension of the phenomena (T-scale>4) and the fact that a major part of the actual stock of the CO_2 has been produced by industrial countries from Europe and Northern America in XIXth and XXth centuries. Emerging countries have full right to invoke this historical responsibility of most developed countries and to suspect them to use sustainable development as a way to limit their actual economic growth.

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[6] The so-called « economic ecological efficiency » which is based on the comparison between share of emissions of CO_2 and share of world GDP (expressed in $ and not pps) is a real moral failure which is nevertheless used by many states to justify their actual excess of CO_2 emission. If European policy makers have a minimum sense of responsibility, they should not use such argument in negotiations!

To analyse the phenomena at different territorial scales like division of the world in 17 regions or 3 macro-regions (Figure 8) is especially interesting because it introduces alternative political approaches of the solution to the global problem of climate change. At regional level (Figure 8), we can for example notice that the fusion of China, Japan and Korea into a single unit produces equilibrium between the share of population and CO_2 emission. It means that the objective of global equilibrium could be achieved in this case by a technical cooperation between the states of the region instead of separate actions at national level. Japan has indeed proposed to obtain delays for the reduction of its own emission of CO_2 but to help China to develop industrial technologies producing less CO_2. This is typically a pragmatic win-win political solution if it is correctly applied. The European Union has also proposed to fix a global objective for all members States in order to have more smoothness in the application of Kyoto's protocol. But in this case the solution is not sufficient to obtain equilibrium because all members States have excess of CO_2. It is only at the upper level of world divided in 3 macro-regions (Figure 8) that Europe can eventually develop the same strategy as Japan. In this scenario, Europe should develop partnerships with all states of Africa, middle-east and former Soviet Union in order to really fulfil its obligation at the world level. A unilateral reduction of CO_2 emission in UE25 would probably be economically difficult to support for European industry and it would not necessary be efficient at the world scale because industries producing CO_2 would certainly decide to relocate in neighbouring eastern and southern periphery of Europe. It is typically a lose-lose solution, derived from the fact that the geographical scales of political action is not the good one. To complete the picture, we can notice that USA are not able to develop an equivalent strategy of macro-regional cooperation because, even if they involve Northern and Southern America in a common project, there would remain a strong excess of CO_2 as compared to population of Americas. It is only through cooperation with major States of Asia, such as India, that USA could achieve the same political objective as EU or Japan.

Of course the approach developed above is strongly influenced by the choice of territorial divisions which has been used for the delineation of world regions and macro-regions. We can suspect that another definition of the ESPON regions would have produced another political result. Therefore it is necessary to complete the analysis by another cartographic approach which computes the global potential of CO_2 emission in a neighbourhood of 1000 km without considering political boundaries (Figure 9). This map of CO_2 potential which was presented in the preliminary report of ESPON 3.1 on "Europe in the World" displays a perfect representation of the "Economic Triad" and is strongly correlated with the map of GDP potential established with the same parameter. It indicates clearly that it is impossible to build a world policy of reductions of CO_2 without an international policy at macro-regional level, with at least three big agencies of objective in northern part of the earth and eventually three smaller agencies in southern part (because of equivalent small peaks of CO_2 emission in southern Africa, southern America and Oceania).

This small example demonstrates that it is not possible to build new policy without building new tools of analysis and representation: *the limits of my language mean the limits of my world" (L. Wittgenstein).*

Figure 8 : A multiscalar Territorial Analysis of Kyoto's Protocol
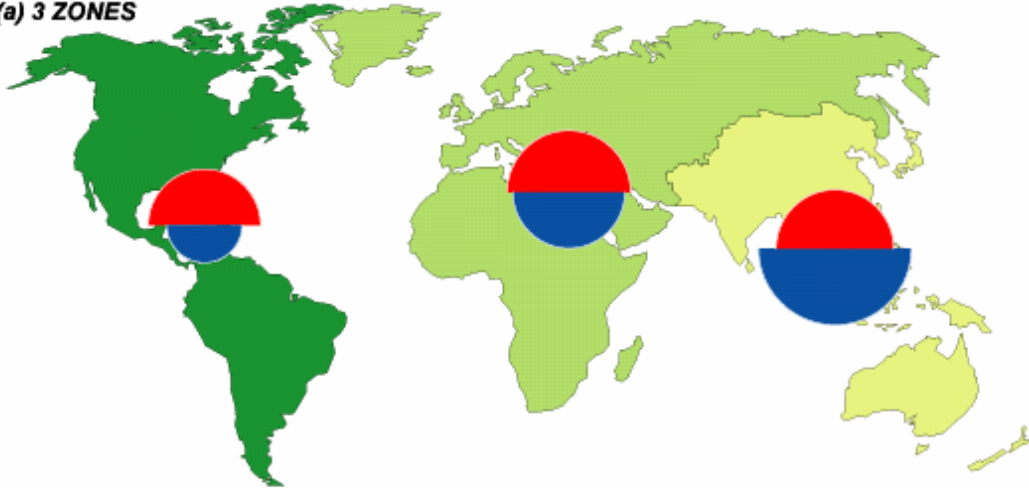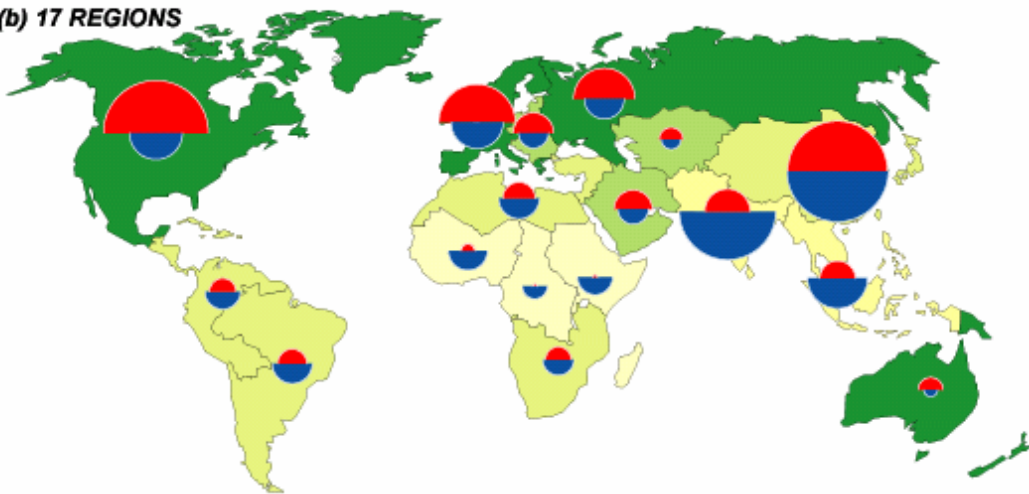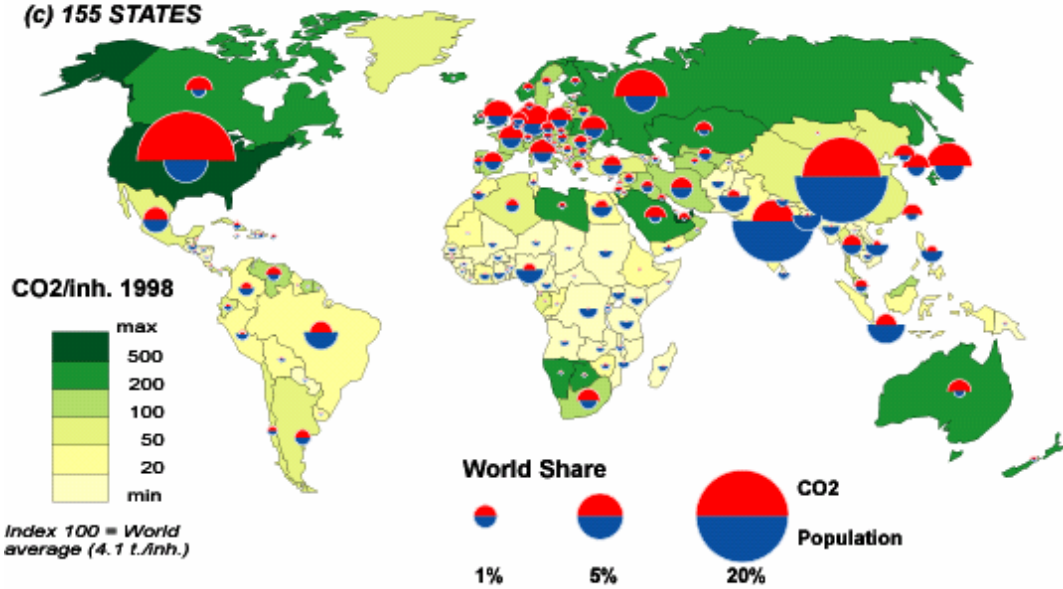
(c) Grasland C., 2004, CNRS-UMR Géographie-cités-UMS RIATE

Figure 9 : A global spatial vision of Kyoto's Protocol

South-Western Pacific

EASTERN ASIA

NORTHERN AMERICA

WESTERN EUROPE

South-Eastern America

Southern Africa
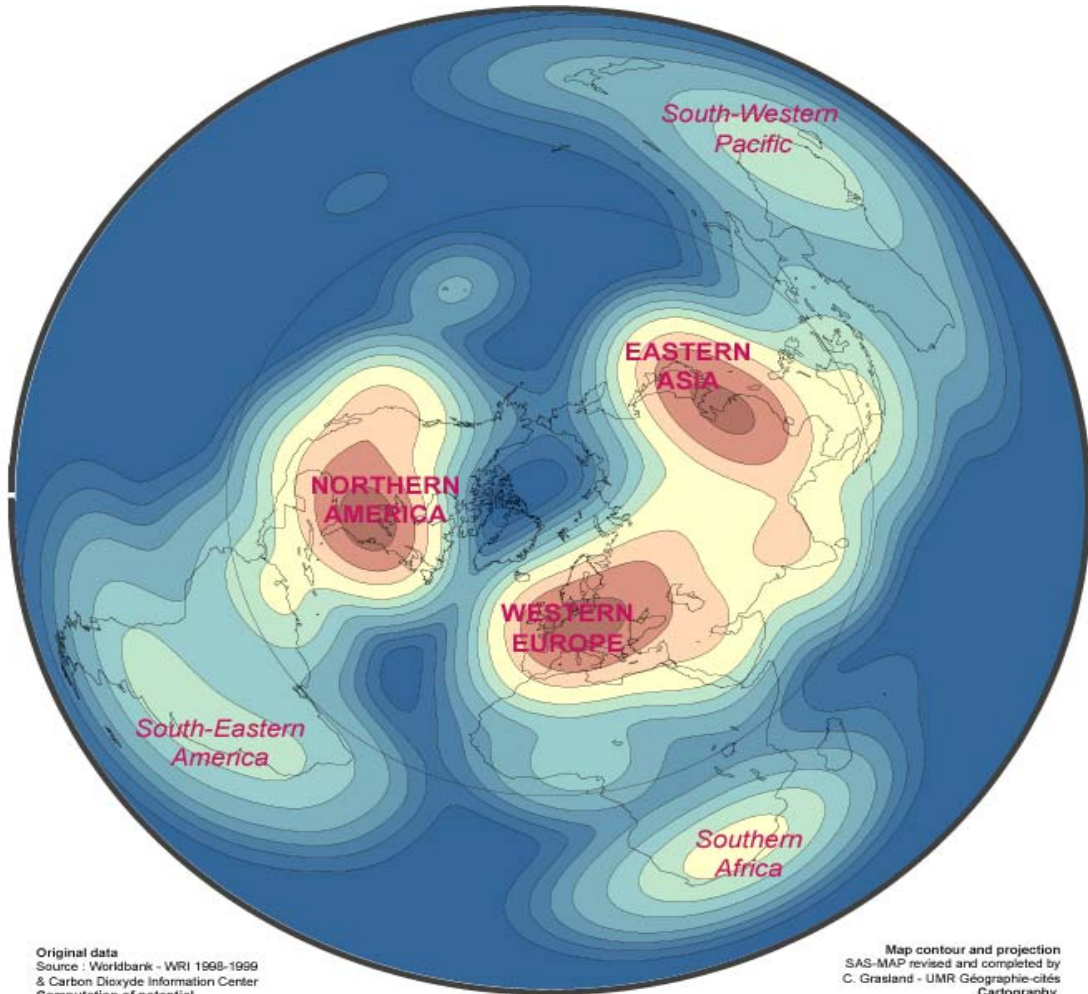
Original data
Source : Worldbank - WRI 1998-1999
& Carbon Dioxyde Information Center
Computation of potential
ID-IMAG / The Hypercarte Project

Map contour and projection
SAS-MAP revised and completed by
C. Grasland - UMR Géographie-cités
Cartography
Map realised with Surfer

CO2 Emissions 1998 located in a gaussian neughbourhood span 1000 km

10000
5000
2000
1000
500   millions
200   of t.
100
50
20
10
5
2
0
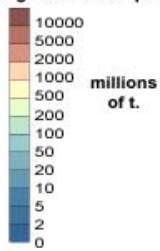
The pollution potential of a point at the surface of the earth is a sum of all local emissions of carbon dioxyde weighted by a decreasing function of distance. The function used in this analysis is a gaussian function $f(d) = \exp(-a.d^2)$ where $f(1000\ km) = 0.5$

For more details , see.

Grasland C., Madelin M._2001, The unequal distribution of population and wealth in the World , *Population et Société*, INED, 4 p. (*http://www.ined.fr/englishversion/publications/pop_et_soc/pesa368.pdf*)
Grasland C., 2001, Mapping CO2 emissions on the earth (ca. 1995) : Cartographical problems and political issues, *Annales des Mines - Réalités Industrielles*, pp. 79-87 (*ISSN 2.7472.0276.3*)

(c) Grasland C., Grataloup C., 2003, CNRS-UMR Géographie-cités-GDR Libergeo

C ASSESSMENT ON DICTIONARIES AND TOOLS

C.1 EVALUATION OF DATA SITUATION
Clarisse Didelon, Claude Grasland

The objective of the WP5 (data and maps harmonization) is to proposed standardised databases and maps to allow the comparison of analyses, the common use of the results in cross thematic questions and to allow the reproduction of statistical analyse step in the future, for example if we could get some updated data on our subject in few years. However, the list of variables and indicators we will use is not yet fixed and is likely to evolve when the program move forward. The following part is an attempt to present the main objectives of the project that determine the data requests, to make a presentation in the particular context of this project that integrate the world scale, and to present our first attempts to propose a procedure for the harmonisation of the datasets. What is quite new for the 3.4.1. ESPON project "Europe in the World, the World in Europe in comparison with other projects is that our aim is to build databases related to the world i.e. at State scale and that we will do not use very often databases at larger scales like NUTS2 or NUTS3. More, we aim to build databases that take into account long period in the past to allows us to analyse the evolution of the (place / status) of EU25 space in the framework of a large time scale.

C.1.1 DATA: WHAT WE WANT TO MESURE?

In order to decide which data and indicators will be used it is necessary to have a clear idea of our objectives in this 3.4.1. ESPON program. The mains questions of the programme "Europe in the World" are exposed in the WP3: Cross-thematic analysis of key-questions. Key questions are the following ones:

- World regions and global integration zones. This part aim first to provide a division of the world thanks to the analyse of two kind of datasets: regular datasets of structural or flows data and specific datasets on "mental maps" build for the occasion according the division of the world proposed by firms and international organisations in their websites. The second main aim is to review the world as a whole and the key metropolitan regions in term of their functional bases and development trajectories in order to develop ideas about the spatial possibilities for further GIZ development within Europe. Here the data used will be secondary sources and interviews in the framework of case studies 8.4: Exploration of Gateways and GIZs in other continents.

- Europe in its networks. This key question will examine the linkages that connect the different parts of the world and the different places within Europe. It is mainly based on air flows analyses between cities but also take into account different kind of flows like trade or migratory flows. Databases used in the framework of that key question will mainly be matrix of relations between places that could be cities, countries or regions.

- Delimitation of European influence area. This question in centred on the Euro Mediterranean region as defined below. It will use structural and flow data on many subject in order, to determine first, the position of discontinuities between the European countries and neighbour countries, then the intensity of links in term of trade, investments, demography in order to give a delimitation of European influence area.

- Internal differentiation of European territory. This key question will analyse the influence of the World on the European space. Different theme will be integrated into a cross-analysis in order to

elaborate a complete picture of the regional impacts of globalisation in all its aspects. This key question is strongly linked with the previous key question as the relation with neighbourhood countries could have an influence on the European space, but it is also linked to the rest of the World. This key question will handle databases of two kinds: structural databases on a larger scale than the state one (NUTS2 or NUTS3) and relation databases between European regions and the other countries of the World.

C.1.2 DATAS AND MAIN SOURCES:

The programme Europe in the World aims to determine the evolution of the position of Europe in the World, first by analysing past trends, second future possible ones (policy recommendations). Our mains work packages do not involve the exclusive use of determine thematic dataset on the contrary. For example we can not assume to propose a division of the world (WP2.6) that would take in account only data related to wealth or population.

The ESPON program gathered a vast amount of data and indicators, either in each TPG either provided by Eurostat. The table 8 of the Nijmegen Guidance paper provide a helpful list of all the indicators gathered in the ESPON program. However in the framework of our project it seems quite difficult to use them intensively. First, because those indicators have to be extended in time by creating longer time series. Second because most of those indicators are gathered at a NUTS2 or NUTS3 level and are only available for European or ESPON countries. Some parts of the projects (WP 3.4 internal differentiation of European territory) could fruitfully use the indicators provided by other TPG but it will not be the case for most of our work package related to the world. As a consequence a specific database have to be built and that will be done mainly by RIATE and Géographie-cité with a active collaboration of IGEAT that is involved in the project ESPON 3.2 and has a work package on long term databases.

Most of the database sources are issued by international organisation (as UNCTAD, WDI, OECD) but other relevant sources exist. We'll now present the different sources according to the kind of data we would like to gather and databases we would like to build.

C.1.2.1 STRUCTURAL DATABASES

Concerning population and GDP, for this first interim report, we mainly used the Maddison databases. This database is published by the OECD and freely available on Mr Maddison website (http://www.ggdc.net/~Maddison/). This dataset provide the populations and GDP of all territorial units of the world from the first year after J.C. to 2001. Concerning far past time a lot of data are missing. From 1900 to 1950 all the African continent and some parts of Asia are missing. After 1950 they are very few missing data. All the data are derived from *The World Economy: Historical Statistics*, *OECD Development Centre, Paris 2003*. GDP figures are in millions of 1990 US$ (converted at Geary Khamis PPPs). This database providing long term data on population and GDP have been very useful for our exploratory analysis. All maps of this first interim report related to population and GDP have been built thanks to this database.

The *UNCTAD Handbook of Statistics On-line*, (http://www.unctad.org/), provides numbers of development indicators for the most recent years for more than 220 countries but a lot of data are missing. Some trade data (value of exportations / importations by countries) are available from 1950. This website provide too the Foreign Direct Investment from 1970. The *World Development Indicators*, 2003, a World Bank publication provide also a large number of indicators (575), describing about 210 countries. Indicators are related to demography, environment, economy, state and market, and global links. Available periods range from 1960 to 2001. UMS RIATE owns the DVD-ROM providing the data.

For future analysis the FAO database on agricultural productions, nutrition, food aid flows, land use, exportations of cereals etc… are freely available on FAO STAT website (<http://apps.fao.org/>). But, the raw data need to be strongly reorganised before an effective use. Some variables are available from 1960. The number of countries available varies according to the number of countries concerned: for example oats production concern 79 countries in 2004 and maize production 163 countries.

Cultural and historical databases could be obtained on the *World Cultural Report* produced by UNESCO (http://www.unesco.org/culture/worldreport/). The indicators concern territorial units that have more than 1 million populations: we can get information for only 150 States. Data are not very recent: all are from before 2000. Indicators available range from media production (movies, newspapers…) to language and religion, cultural practice (cultural site frequentation) and tourism flows. In numbers of tables a lot of data are missing. Another source is available. The UNO *demographic yearbook* (Special census topic vol.2) will provide too few cultural data (forthcoming mid 2005) on national/ethnic group of population, language and religion. The CEEPI (Centre d'Etudes Prospectives et d'Informations Internationales) database provides data on countries and their main city or agglomeration. Variables, which applied to 238 territorial units, describe languages, historical links (like the colonizer country), the belonging to one continent, or the fact that the territorial unit is landlocked or not.

Labour statistics are available on the ILO website (International labour organisation) (http://laborstat.ilo.org/) for 243 territorial units (divided in 5 geographical areas) from 1976 to 2004. The ILO database try to provide data on all territorial units than have reach at least 200 000 inhabitants in the middle of the 1990 year. Variables describe the employment/unemployment level, labour wage, consumer prices. That sounds quite attractive but tables provides by the website are not very user-friendly and a lot of data are missing, even for recent time periods. The Groningen Growth and Development Centre, *Total Economy Database*, (January 2005, http://www.ggdc.net) provide too data related to labour (employment, hours worked) but only about 100 territorial units are proposed and a lot of data are missing, even for recent years for African, Asian or Middle-East countries.

C.1.2.2 AIR FLOWS DATABASES

The program ESPON 3.4.1 Europe in the Word will use two distinct kinds of flows databases. The first ones concern the flows between **cities**, the second ones between **countries**.

The Europe in its network key question takes into account world inter-city air flows database at two different periods during the last ten years. While air flows are among the worldwide data that are the easiest to obtain, the different sources are not compatible the ones with the others and it is not evident to harmonize them. In addition, one should, from the begin, be also aware that a database that collect data on flows between the airports/cities gives different figures from a database that collect data on the traffic of each airport/city. This difference comes, in particular, from the through traffic.

Working on air flows for more than ten years, and having tested different sources from different international institutes and organization, the responsible team of this question has chosen, for the flows figures, two major databases : from OACI and from ITA. Several reasons can explain this choice. In particular: the OACI database is quite the only one to provide a database that is comparable for a long period of time. While the ITA database is for a few international linkages more accurate and could constitute a complementary source of information.

The other main difficulty of this key question relates to the air freight figures. While main analysis and conclusions will be drawn from the number of air passengers that travel all over the world, one cannot avoid taking into account the tons of freight that are carried between the cities. Indeed, for the last ten years, the air cargo recorded considerable increases taking into account the fall in the costs in air

transports. But at that stage the collection of such data is not guaranteed partly because of the reliability of the sources.

Some figures and databases have already been tested and used in Nadine Cattan's previous researches and in particular in ESPON 1.1.1.

C.1.2.3 OTHER FLOWS DATABASES

The program ESPON 3.4.1 Europe in the Word will also use flows databases describing bilateral relations between **countries**. Here we could use trade flows between countries like the International Trade Centre database (UNCTAD/WTO United Nations Statistics Division) about export and imports flows.
The DG trade (http://europa.eu.int/comm/trade/index_en.htm) provide also a database on trade flows for extra European countries quoting for each of them the 20 first importing and exporting partners. The files provide also data on imports and exports by 21 kinds of products (like vegetable products, wood and article in wood, textiles and textiles articles, miscellaneous manufactured articles). Relation for a country is describing for Europe as a whole and not detailing all European countries. 127 countries and groups of countries are described than mean it is not a exhaustive database. More, data are available only for the year 2004.
Flows databases seem to be more difficult to obtain, particularly concerning subjects like migration flows and long term databases are scarce.

C.1.2.4 PROXIMITY DATABASES

In order to analyse the relation between the flows intensity between two countries and their proximity is useful to have a distance database between each countries. The CEPII bilateral file provide different kind of distances between 28 224 pairs of countries (168 * 168). Two kind of simple distances are provided one between the most important cities or agglomeration in term of population and one between the capitals cities. Some weighted distances (by to population) are also proposed. This database describes also some common cultural or historical facts as a common official and ethnic language, a common colonizer between two countries. This database provides also a very precious variable describing the fact that two countries were part of a same administrative entity for a long period in the past. This is especially useful to take into account the common past between territorial units that formerly belonged to the same Empire as Austria and Hungary, and countries that have been split in two or more parts as the former Czechoslovakia or Yugoslavia.

C.1.2.5 SPECIFIC DATABASES

A specific database will be built by the UMS RIATE based on a survey on the ESPON community members, i.e. researcher, administrative and politicians of the ESPON program. The questionnaire is now in a test phase and the survey will be held during the ESPON meeting in May in Luxembourg. Apart from description data (sex, age, activity in the ESPON program), the survey is about, first, the delimitation of Europe, second the delimitation of world regions. The Europe database describes for each country its belonging of Europe or not. The World Regions database is build in the same way than a matrix of flows, describing the belonging of two territorial units to the same region.
Another specific database on mental maps will be built. It aims to gather the divisions of the world proposed on maps by big firms, non governmental organizations and international organisations websites.

C.1.3 DATA REQUEST

To complete its analyses the team from the key question on "Europe in its neighbourhood" would need further data – but we doubt we will get them all either from Eurostat or OECD:
- Data on employment, under-employment and training by skill levels and sex in all neighbouring countries
- Data on maritime flows that would compare the Baltic integration and the Mediterranean (including Black Sea) divide, for both passengers and goods
- Comprehensive energy trade and precise routs, that would facilitate the understanding of Ukraine's and Caucasian countries' transit role for Russian or Caspian oil and gas
- A comprehensive remittances matrix o/d in order to measure the importance of these financial flows for neighbouring countries, and to understand the links between migrations and economic regional development
- Up to date data on public aid – both bilateral (European countries) and multilateral (UE) subsidies, through an o/d matrix again
- Russia data or precise data on Russia in order to evaluate its role in the NIS economic space organisation (vs. increasing western Europe influence on Caucasian countries or Ukraine)
- Data on air and water pollution interdependencies.

For other key questions it would be very useful to get long term bilateral databases describing some flows like migration, tourism, students, goods trade and foreign direct investments... When bilateral databases are available, it is often for one year only and when long term databases are available it is often not a bilateral dataset.

C.1.4 HARMONIZATION OF DATASETS

In order to allow the cross thematic analysis of results elaborated by each partner teams in WP2, the statistical harmonisation is of great importance.

C.1.4.1 WORLD DATABASES: 168 COUNTRIES

We established a minimum list of territorial units that necessarily have to be covered by data collection. First, we use, as a criteria, the share of the world surface, population and GDP of each territorial unit. If a territorial unit count less than one millionth of the world surface OR the population OR the world GDP, we decided to consider it as being a part of the rest of the world.

Before using any statistical criteria of selection, the choice of territorial unit is first of all drive by the question of their sovereignty. First we included the full sovereign territorial units with their main parts and overseas part (i.e. France + Martinique, Guadeloupe, Guyana and Reunion). Then there the question of associated territories has to be considered (In the case of France: Mayotte, Saint-Pierre & Miquelon…). They have not been added to the database. The remaining territorial units are more problematic between States that are not fully sovereign (Puerto Rico) and those States that are not recognised by all the other (Taiwan, Western Sahara, West Bank & Gaza, Northern Cyprus…).

The following table gives the list of the 168 countries kept in our analyses (Table 6).

Table 6 : 168 countries for Europe in the World

ISO	Name	ISO	Name	ISO	Name
AFG	Afghanistan	GHA	Ghana	NIC	Nicaragua
AGO	Angola	GIN	Guinea	NLD	Netherlands
ALB	Albania	GMB	Gambia	NOR	Norway
ARE	United Arab Emirates	GNB	Guinea Bissau	NPL	Nepal
ARG	Argentina	GNQ	Equatorial Guinea	NZL	New Zealand
ARM	Armenia	GRC	Greece	OMN	Oman
AUS	Australia	GRL	Greenland	PAK	Pakistan
AUT	Austria	GTM	Guatemala	PAN	Panama
AZE	Azerbaijan	GUY	Guyana	PER	Peru
BDI	Burundi	HND	Honduras	PHL	Philippines
BEL	Belgium	HRV	Croatia	PNG	Papua New Guinea
BEN	Benin	HTI	Haïti	POL	Poland
BFA	Burkina Faso	HUN	Hungary	PRI	Puerto Rico
BGD	Bangladesh	IDN	Indonesia	PRK	North Korea
BGR	Bulgaria	IND	India	PRT	Portugal
BHR	Bahrain	IRL	Ireland	PRY	Paraguay
BHS	Bahamas	IRN	Iran	QAT	Qatar
BIH	Bosnia	IRQ	Iraq	ROU	Romania
BLR	Belarus	ISL	Iceland	RUS	Russian Federation
BLZ	Belize	ISR	Israel	RWA	Rwanda
BOL	Bolivia	ITA	Italy	SAU	Saudi Arabia
BRA	Brazil	JAM	Jamaica	SCG	Serbia/Montenegro
BTN	Bhutan	JOR	Jordan	SDN	Sudan
BWA	Botswana	JPN	Japan	SEN	Senegal
CAF	Central African Republic	KAZ	Kazakhstan	SGP	Singapore
CAN	Canada	KEN	Kenya	SLE	Sierra Leone
CHE	Switzerand	KGZ	Kyrgyzstan	SLV	El Salvador
CHL	Chile	KHM	Cambodia	SOM	Somalia
CHN	China	KOR	South Korea	SUR	Suriname
CIV	Côte d'Ivoire	KWT	Kuwait	SVK	Slovakia
CMR	Cameroon	LAO	Laos	SVN	Slovenia
COD	Zaire (Congo DRC)	LBN	Lebanon	SWE	Sweden
COG	Congo	LBR	Liberia	SWZ	Swaziland
COL	Colombia	LBY	Libya	SYR	Syria
CRI	Costa Rica	LKA	Sri Lanka	TCD	Chad
CUB	Cuba	LSO	Lesotho	TGO	Togo
CYP	Cyprus	LTU	Lithuania	THA	Thailand
CZE	Czech Republic	LUX	Luxembourg	TJK	Tajikistan
DEU	Germany	LVA	Latvia	TKM	Turkmenistan
DJI	Djibouti	MAR	Morocco	TTO	Trinidad and Tobago
DNK	Denmark	MDA	Moldova	TUN	Tunisia
DOM	Dominican Republic	MDG	Madagascar	TUR	Turkey
DZA	Algeria	MEX	Mexico	TWN	Taiwan
ECU	Ecuador	MKD	Macedonia	TZA	Tanzania
EGY	Egypt	MLI	Mali	UGA	Uganda
ERI	Eritrea	MLT	Malta	UKR	Ukraine
ESH	West Sahara	MMR	Burma (Myanmar)	URY	Uruguay
ESP	Spain	MNG	Mongolia	USA	United States
EST	Estonia	MOZ	Mozambique	UZB	Uzbekistan
ETH	Ethiopia	MRT	Mauritania	VEN	Venezuela
FIN	Finland	MUS	Mauritius	VNM	Vietnam
FJI	Fiji	MWI	Malawi	WBG	West-Bank and Gaza
FRA	France	MYS	Malaysia	YEM	Yemen
GAB	Gabon	NAM	Namibia	ZAF	South Africa
GBR	United Kingdom	NER	Niger	ZMB	Zambia
GEO	Georgia	NGA	Nigeria	ZWE	Zimbabwe

As shown in the table, each territorial unit is represented by a code in three letters (ISO) that is the first column of all the databases we build to allow to cross the databases (for multivariate analysis for example). In the second interim report, the native codification used by statistical organisation or project partners will be systematically compiled in a dictionary of territorial unit. More, we'll build a table of correspondence for territorial units which has been subject to modifications in order to establish coherent time series in a medium or long term perspective).

C.1.4.2 EUROMED DATABASE

For the specific analyses undertaken under the following Work-Packages, WP 2.5 (European Neighbourhood) & WP 3.3 (Delimitation of European territory), we decide to build intermediate databases that would provide a shorter list than the all world but larger than those related to the conventional ESPON space. This intermediate space should be able to provide a framework for the analysis of the influence area of Europe and the main discontinuities (in term of demography, wealth etc…) between the European space and the neighbours.

During the project 3.4.1. kick-off meeting, discussions were on the meaning of neighbourhood. They are two different kinds of neighbour countries: those that are very close to Europe (spatial neighbourhood) and those that have very strong links with one (or more) European country (networking neighbourhood). According to the fact that, in this field, our objective is related to the delimitation of European influence area Europe limits, it seems more relevant to choose the spatial neighbourhood. (More, the networking neighbourhood should be analysed in the WP3.2 networking the world, at the world scale.

The choice to make analysis in an intermediate space implied to build a specific map template whose construction is detailed in the following part: Standards for cartography.

The following table (Table 7) gives the list of the 82 **EUROMED** countries kept in our analyses.

Table 7 : Euromed list of countries

ISO	Name	ISO	Name
ALB	Albania	KWT	Kuwait
AND	Andorra	LBN	Lebanon
ARE	United Arab Emirates	LBY	Libya
ARM	Armenia	LIE	Liechtenstein
AUT	Austria	LTU	Lithuania
AZE	Azerbaijan	LUX	Luxembourg
BEL	Belgium	LVA	Latvia
BGR	Bulgaria	MAR	Morocco
BHR	Bahrain	MCO	Monaco
BIH	Bosnia	MDA	Moldova
BLR	Belarus	MKD	Macedonia
CHE	Switzerland	MLI	Mali
CYP	Cyprus	MLT	Malta
CZE	Czech republic	MRT	Mauritania
DEU	Germany	NER	Niger
DNK	Denmark	NLD	Netherlands
DZA	Algeria	NOR	Norway
EGY	Egypt	OMN	Oman
ERI	Eritrea	POL	Poland
ESH	West Sahara	PRT	Portugal
ESP	Spain	QAT	Qatar
EST	Estonia	ROU	Romania
FIN	Finland	RUS	Russian Federation
FRA	France	SAU	Saudi Arabia
FRO	Fareo Islands	SCG	Serbia/Montenegro
GBR	United Kingdom	SDN	Sudan
GEO	Georgia	SEN	Senegal
GIB	Gibraltar	SJM	Jan Mayen
GRC	Greece	SMR	San Marino
GRL	Greenland	SVK	Slovakia
HRV	Croatia	SVN	Slovenia
HUN	Hungary	SWE	Sweden
IMY	Isle of man	SYR	Syria
IRL	Ireland	TCD	Chad
IRN	Iran	TKM	Turkmenistan
IRQ	Iraq	TUN	Tunisia
ISL	Iceland	TUR	Turkey
ISR	Israel	UKR	Ukraine
ITA	Italy	UZB	Uzbekistan
JOR	Jordan	WBG	West-Bank and Gaza
KAZ	Kazakhstan	YEM	Yemen

C.1.4.3 ESPON DATABASE

For projects that will analyse more in detail the European space according to the world influence, (W.P. 3.4 Internal differentiation of the European territory, and some cases studies). In those cases the databases and indicators built by other ESPON projects (at NUTS2 or NUTS3 level) will have to be used. The following Table 8remind the ESPON countries.

Table 8 : ESPON list of countries

ISO	NAME
AUT	Austria
BEL	Belgium
CYP	Cyprus
CZE	Czech republic
DNK	Denmark
EST	Estonia
FIN	Finland
FRA	France
DEU	Germany
GRC	Greece
HUN	Hungary
IRL	Ireland
ITA	Italy
LVA	Latvia
LTU	Lithuania
LUX	Luxembourg
MLT	Malta
NLD	Netherlands
POL	Poland
PRT	Portugal
SVK	Slovakia
SVN	Slovenia
ESP	Spain
SWE	Sweden
GBR	United Kingdom
BGR	Bulgaria
NOR	Norway
ROU	Romania
CHE	Switzerland

C.2 ESPON MAPS HOUSE STYLE BOOK

Nicolas Lambert, Christine Zanin

The objective of the WP5 (databases and maps) is to make « proposal for an effective statistical and cartographical framework for the needs of the research, in particular in relation to the questions of geographical projection and by adapting the level of aggregation to the specific needs European policy ». This work package is more generally responsible from the harmonization of maps produced by the partners. The thoughts for maps harmonization will be present here with the template proposed to partners for each scale /theme of analyse.

One of the tasks for the ESPON Project 3.1 was to develop new cartographic and spatial analysis tools that could be used by all other TPGs of the ESPON Programme, and at a later stage also by end-users. ESPON is not a single institution. Instead, it is a research project network. Every project includes a team of partners from different European countries. It was sensed from the outset that ESPON needed some common base and means to steer the various TPGs so as to achieve coherence and identity in the ESPON outcome. The TPG 3.1 proposed a few templates for the design of European territory maps (projection, shape, design …).

As ESPON is above all about spatial patterns and trends, it was clear that most of the outcomes would be shown on maps. Therefore, a common ESPON map layout, for all separate TPGs, was essential. Project 3.1 designed a first draft for map layout. The design of maps showing the European situation in the world entails many technical questions (projection, framework, aggregation level …) of crucial importance from scientific and political viewpoints. The third Interim Report (annexe-b) brought to the fore a map projection which gives the opportunity of a polycentric, but universal representation. This polycentric projection had been justified: "none of the world economic centres is stressed, as far as it can be used in any direction. This implicit message is essential for the analysis of a polycentric Europe in a polycentric world".

All those thoughts were very useful but now, we need to settle down our choices for map presentation. It ensures coverage of all regional levels for the ESPON countries (an EU29, a pan European and a world templates). For a complete cartographic presentation, adjacent parts of the surrounding countries were added (the "non ESPON space"), including the map background, borders, and coasts. The Remote Areas and islands are included as insets.

Thus, the ESPON TPGs obtained a unique tool to generate based thematic maps. The standard ESPON map is already used in the cartographic representations in all Interim Reports. Now it is necessary to offer similar rules for the design of maps of Europe in the world, which implies many possible choices.

C.2.1 WHICH CARTOGRAPHIC PROJECTION?

The ESPON program decided to harmonize the maps that are produced in the network and the TPG 3.1 has proposed specific templates for the design of map of the European territory (projection, shape, design …) *(Templates 1)*.

C.2.1.1 TEMPLATE 1 « EU29 »

C.2.1.1.1 Projection

The map is projected in Lambert azimuthal equal area with the centre of 50°N and 15°E

C.2.1.1.2 Geographical influence

Figure 10 : ESPON Space

For the representation of world data and comparisons and as Claude Grasland and Christian Grataloup explained in Annex B of the third interim report, the right planisphere does not exist. The transformation from sphere to plan implies necessarily an undesirable bending of areas and/or angles and/or global shapes. Furthermore, a map of the World can be unsatisfactory because the global world is economically organized as a ring around the earth while a map is a plane representation with edges defining a single center. The more traditional projections (*projections 1 and 2*), like Mercator or Winkel projections directed toward the north and centered on Europe, show an acceptable world organization of the XIXth century at the time when the Old Continent ruled the other regions of the Earth.

Today we live in a polycentric world. And pictures that try to provide evidence of multiple centralities and competitive influence areas should not induce biases related to false polarization introduced by the choice of map projections. It is the reason why C. Grasland and C. Grataloup proposed ESPON to choose a polar projection, setting Northern Hemisphere at the center, simply because it is the place where 90% of the human beings are living. Such a map can easily be underlined in order to emphasize the various centralities (*Template 2*).

C.2.1.2 PROJECTION 1: THE MERCATOR PROJECTION

Figure 11 : Mercator projection
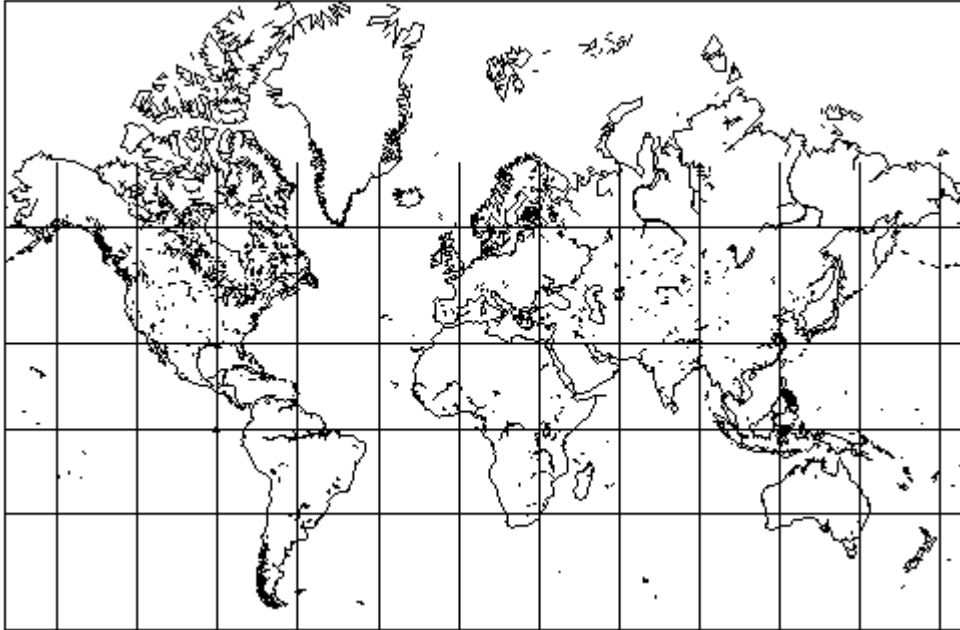
While Mercator maps do not have a grid (except in latitude and longitude), there is an implicit grid, and since this is how they are constructed. The Easting and Northing values shown here are for a 1:1 scale chart, and also note that these values are measured on the chart, <u>not</u> on the earth! Mercator's projection preserves exactly what sailors needed: shapes and directions. On a globe, the lines of longitude (measuring east-west position) converge at the poles and the lines of latitudes (measuring north-south position) are unvarying distant apart. In a Mercator projection, the lines of longitude are straight vertical lines equal distance apart all latitudes, and horizontal distances are stretched above and below the equator this stretching is exaggerated near the poles.

C.2.1.3 PROJECTION 2: THE WINKEL PROJECTION

Figure 12 : Winkel Projection

In true *azimuthal* projections, all directions are preserved from the reference point, usually tangent at the center of the map. The third and best known of Oswald Winkel's hybrid projections is defined by a simple arithmetic mean including the equidistant cylindrical projection, using an arbitrary value for standard parallels (the author preferred approximately 50°28"N/S; another common value is 40°N/S);

Winkel's Triple projection is peculiarly irregular: it is neither equal-area nor conformal; parallels are straight at Equator and poles, curved elsewhere; scales are constant (but not equal) only at the Equator and central meridian. Nevertheless, it manages to present a pleasant and balanced view of the world, which led to its choice by several popular atlases.

C.2.1.4 TEMPLATE 2 « WORLD »

C.2.1.4.1 Projection

The map is projected in North Pole Azimutal Equidistant with the centre of 90°N and 0°E.

C.2.1.4.2 Geographical influence

None of the world economic centers is advantaged; the map can be turned in any directions. This implicit message is essential for the analysis of a polycentric Europe in a polycentric world.

Figure 13 : World North Pole Azimutal Equidistant projections
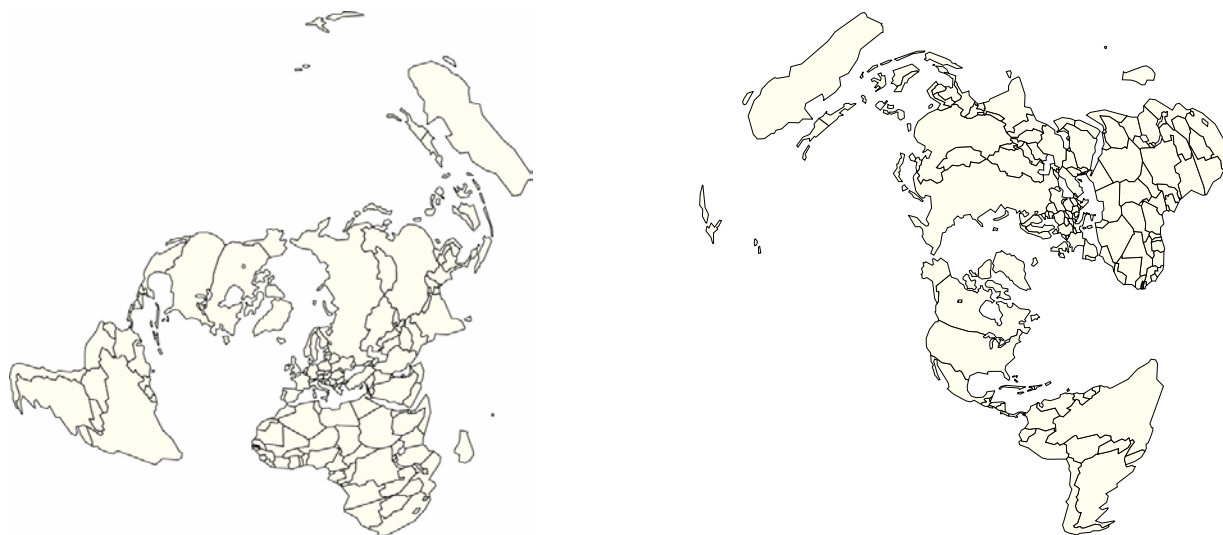
In the ESPON context, it is important to bring to the fore a map projection which gives the opportunity of a polycentric, but also universal, representation. Of course, Southern Hemisphere is badly treated (the disappearance of Antarctica), which proves that any planisphere introduces an implicit subjectivity. With this polar projection none of the world economic centers is stressed, as far as of such map can be used in

any direction. This implicit message is essential for the analysis of a "polycentric Europe in a polycentric world".

Some flows Europe/ World are not always well represented with this polar projection. In order to improve these representations we offer an additional template *(template 3)* : a winkel3 projection with a zoom on Europe. This projection allows a pleasant and balanced view of the world and to puts forward the particular relations between Europe and the world in terms of the directions shown. This template is still under preparation.

Another template has to be produced so as to have a European vision in its wider context, a pan European vision (*Template 4*). The fact of limiting ESPON research program to EU27 or EU29 can generate illusions and induce mistakes in the analysis of main trends shaping the European territory. In many cases, the perception of inequalities, potentialities, polarizations …will be fully transformed according to the geographical shape and the basic territorial units used by observers. It is obvious that the situation of Europe would appear very different if the future scenarios included peripheral areas which are strongly related to Europe like S.E. Mediterranean countries, Africa. This special projection allows for showing all the features about Europe and his close neighbors. The projection is centered on EU29 and is enlarged to the South by the North African countries (some of the analyses show a special limit formed by the Sahara borders) and to the East by the Balkans countries plus Turkey, Russia, Azerbaijan and Kazakhstan. The South and east limits are not actually precisely defined. It will depend on subjects and research results. Besides the previous ESPON report had shown that the ESPON view was certainly the most interesting one in a short term perspective. But the pan-European view and the global view should be taken into account when European policy makers try to elaborate strategies in a long-term perspective.

C.2.1.5 TEMPLATE 3 « PAN-EUROPEAN »

C.2.1.5.1 Projection
The map is projected in Lambert Azimuthal Equal Areas with the centre of 50°N and 18°E.

C.2.1.5.2 Geographical influence

Figure 14 : Europe Lambert Azimuthal Equal Areas projection
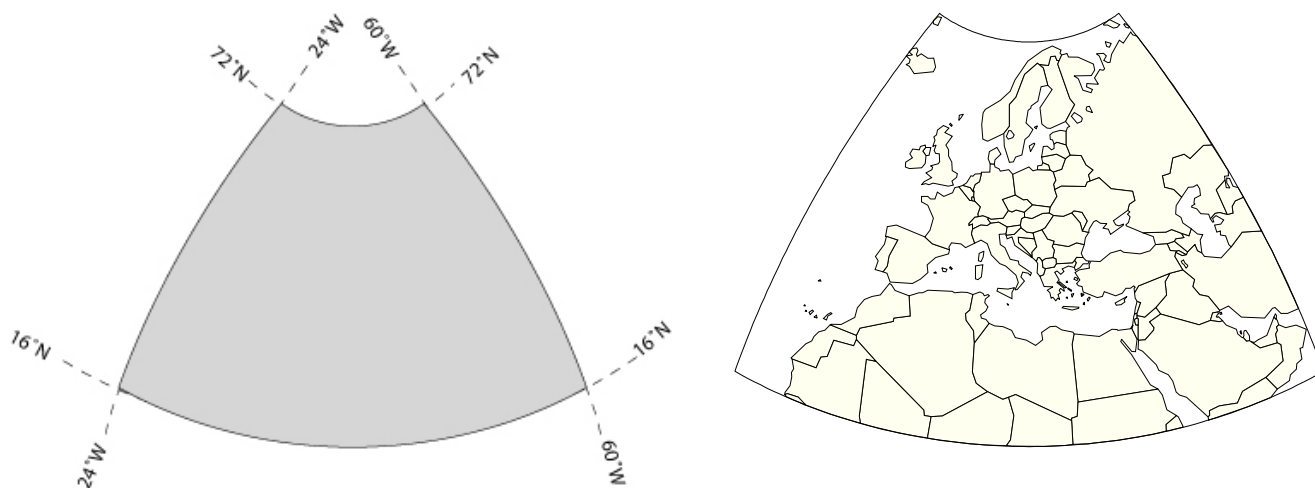
C.2.2 WHICH DIVISIONS?

For a better comparison of maps, different levels of divisions have been defined so as to provide enough layouts for all ESPON projects and data levels. The European Union as any international organization should produce geographical divisions of the world adapted to their statistical, scientific, and political needs.

C.2.2.1 THE NATIONAL LEVEL

The list of States that should be included in the ESPON database "Europe in the world" is not a trivial question. For example, it is well known that Taiwan is never present in the statistical databases of the United Nations because China does not recognize its existence as an independent State. But, on the other hand, the CIA has introduced Taiwan in its "World Fact book" 2 which presents the official position of US Government. An ESPON Atlas of the world would necessarily lead to difficult political questions because, as in the case of the World Fact book, it could be considered as a form of official position of the European Union.

The list of States that should be included in the pan European database depends on the subject matter. The South and East limits would be chosen by authors. Choices of the national level are presented in Map 1, 2 and 3.

Figure 15 : « ESPON Europe divisions »
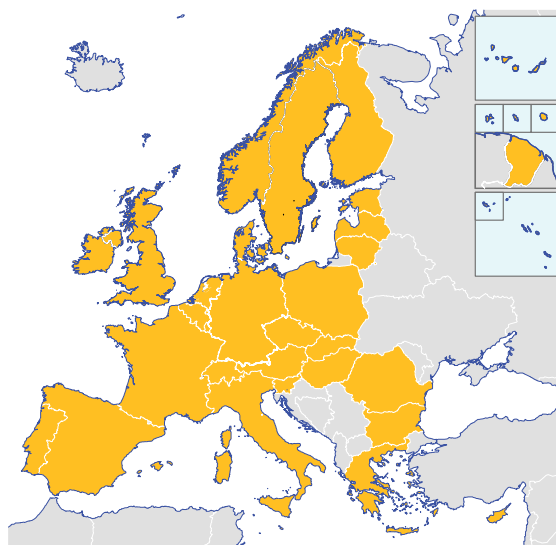
Figure 16 : « WORLD divisions »

Figure 17 : « Pan European » divisions.

C.2.2.2 THE "REGIONAL" LEVEL

More complicated but more important is the question of the delineation of "regions" of the world because it implies necessarily a mixture of ideological, scientific and political constraints. The 17 ESPON regions presented in Map 4 are a provisional typology which will be further improved by the results of the analysis of air and trade flows.

Figure 18 shows the regional delineation of European ESPON countries. We choose NUTS 2 or 3 according to the statistic information.

Figure 18 : regional delimitations of European ESPON countries
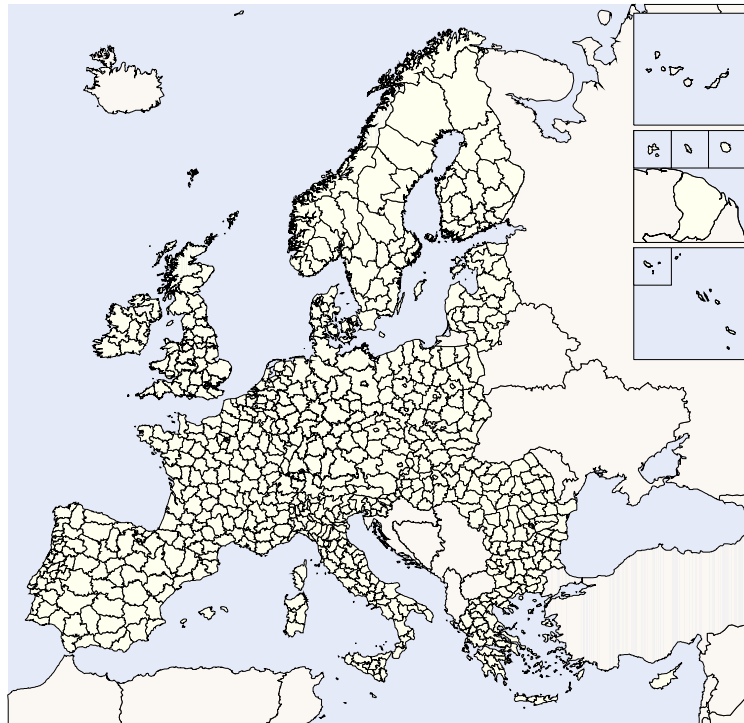
C.2.3 WHICH MESSAGE?

The maps are very powerful tools of communication and they can convey implicit or explicit political message. These different templates have been discussed in a scientific sense but they obviously have to be discussed in a political sense at the next ESPON meeting in May 05.

C.2.4 MAP BACKGROUND AND COUNTRIES

Figure 19 : Map backgrounds

Outline colour: RVB = (255,255,255)
Outline width = 0,2 pts

Fill colour = RVB = (0,0,0)
Fill opacity = 50%

Fill colour : RVB = (0,0,255)

Fill colour : RVB = (229,234,248)

Outline colour: RVB = (255,255,255)
Outline width = 0,2 pts

Fill colour : RVB = (0,0,255)

Fill colour : RVB = (229,234,248)

Outline colour : RVB = (255,255,255)
Outline width = 0.2pts

Fill colour : R,VB : (0,0,255)

Fill colour : R,VB : (0,0,0)
Fill opacity = 50%

Outline colour : RVB = (255,255,255)
Outline width : 0.5pts

Fill colour : R,VB = (229,234,248)

C.2.4.1 COUNTRIES

Fill colour: R,G,B = (255,255,240)
Outline colour: R,G,B = (255,255,255)
Outline width: 0.2pts

C.2.4.2 COUNTRIES AND REGIONS OUT OF UE29

Fill colour: R,G,B = (251,247,242)
Outline colour: R,G,B = (255,255,255)
Outline width: 0.2pts

C.2.4.3 LEGENDS

The previous choices have to be completed by colours and graphic representations. The discussions focused mainly on choropleth and proportional maps, selection of class intervals and tonal shadings. In fact it is very important to avoid the failure resulting not from different graphical traditions, but from theoretical uncertainties concerning the general principles of the graphical language. Graphical signs are assimilated to a discourse that could be read, understood and criticized on grounds of efficiency, and not simply for reasons of personal preference or style.

In order to obtain comparable maps, a precise protocol is proposed at each step. We propose a monochromatic system, gradual shading of two tones, graduated symbols, qualitative shadows, typology with or without hierarchy. We tried to explore each possibility, every alternative for cartographic keys and every possible graphic treatment of information. A few examples of layout are offered so as the whole of ESPON members' maps are homogeneous in presentation while adhering to graphic semiology rules.

Quantitative figures for rates are often given as sorted data. It is possible to use up to 8 categories when gradation is simple and up to 3 categories both sides, when gradation is double. These gradations must be monochrome or a matching gradation (rainbow gradation). A G scale is proposed. It allows to get a data presentation based on a weighted index in accordance with size and order of what is shown. Such a scale is a proxy for a rainbow gradation in 5 categories (beyond this, it would be difficult to grasp any information).

Qualitative data or typologies exclude any particular order. When what is at stake, is an opposition between two elements, one should select red and blue colors. Conversely, when many meanings must be shown together at the same time, several colors should be selected with same graphical weighting.

Finally, gross quantitative data should be shown in accordance with different sizes: circles for fixed geographical data and arrows for flows. For any additional information, a colour can be added to circles in accordance with above-described principles.

Figure 20 : legends propositions

GRATUATED COLOR MAP

Harmonic gradation

CMJN		CMJN		CMJN	
	0,0,10,0		5,0,10,0		20,100,90,5
	0,0,30,0		20,0,30,0		0,20,80,0
	0,0,60,0		45,0,60,0		0,0,30,0
	0,20,80,0		75,0,60,0		0,0,10,0
	0,40,95,0		95,50,25,10		20,0,30,0
	0,60,90,0		95,95,30,20		80,0,60,0
	20,100,90,5		0,0,0,0		95,95,40,50
	0,0,0,0				0,0,0,0

Monochrome gradation

			10%
			25%
			45%
			70%
			100% + 10% black
			0%

Double monochrome gradation

		100% + 10% Black
		60%
		25%
		0%
		25%
		60%
		100% + 10% Black

GRATUATED SYMBOL MAP

circles

- 50%
- 20%
- 10%
- 5%
- 2%
- 1%
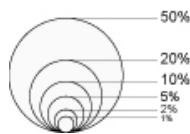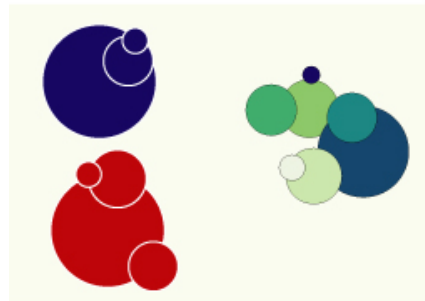
Flows
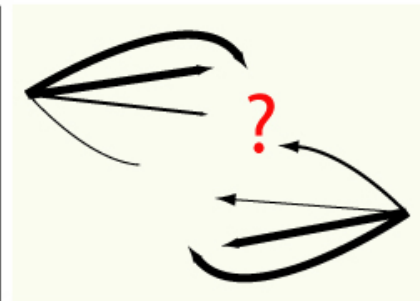
UNIQUE VALUES MAP

Simple opposition

- ⊖
- ⊕

Typology without hierarchy

CMJN		CMJN	
	0,5,85,0		45,0,0,0
	90,5,95,0		55,0,45,0
	20,85,0,0		0,40,20,0
	10,80,95,0		0,0,50,0
	80,80,5,0		0,20,45,0
	0,40,95,0		10,40,0,0

G Scale

0,7		very small
1		small
2		medium
3		large
4		very large
4,4		

Some examples:

Figure 21 : Minimum and maximum values have always to be written clearly.

Title (units)
10
20
30
40
50
60
70
80
Missing data

Population density
inhbts/km²
10
20
30
40
50
60
70
80
Raw data

Population density
inhbts/km²
10
20
30
40
50
60
70
80

Title
Type 1
Type 2
Type 3
Type 4
Type 5
Raw data or missing data

Title (units)
50
20
10
5
2
1

Title
units :
50
20
10
5
2
1

Title (units)
0.2
1
2
5
7
10
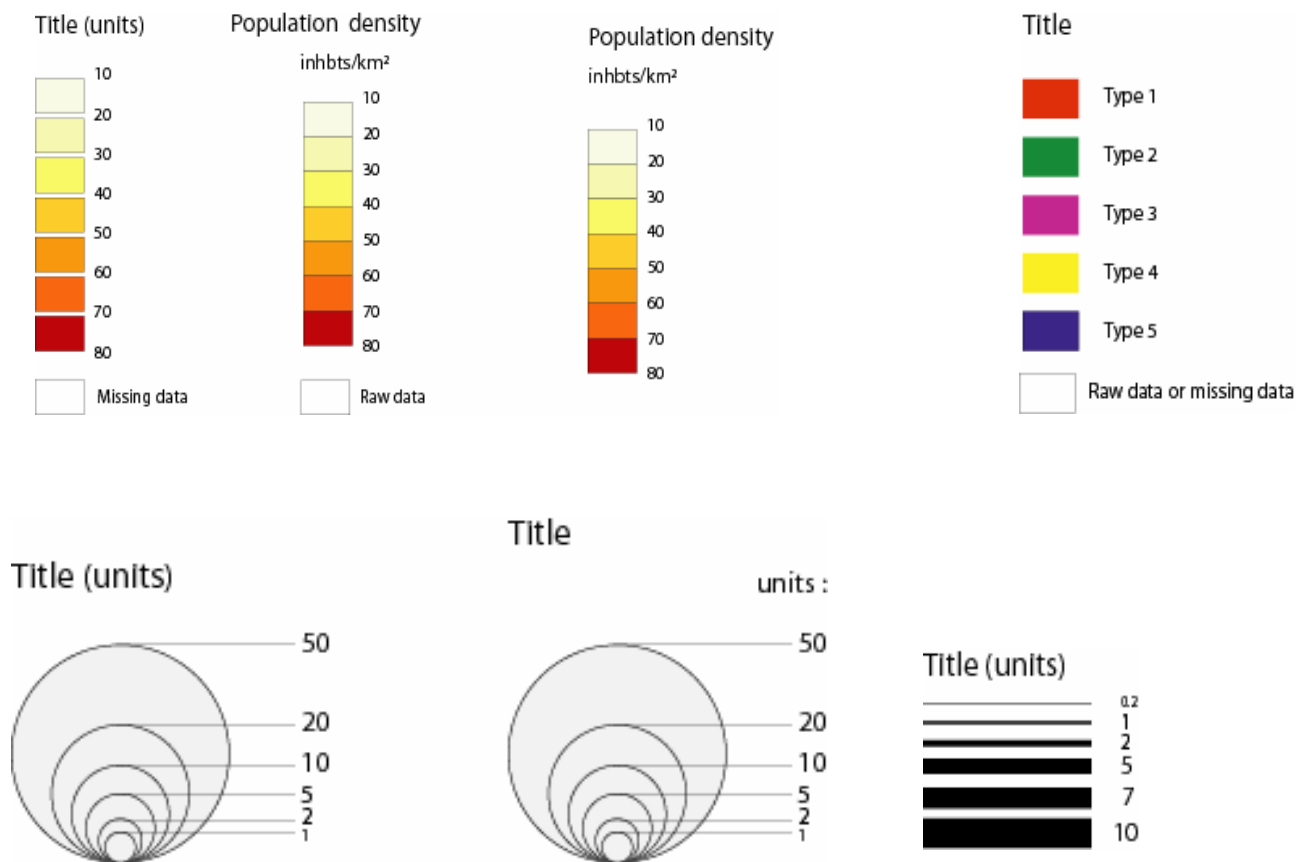
C.2.4.4 Pan European Layout

Figure 22 : 4 examples of Pan European layout
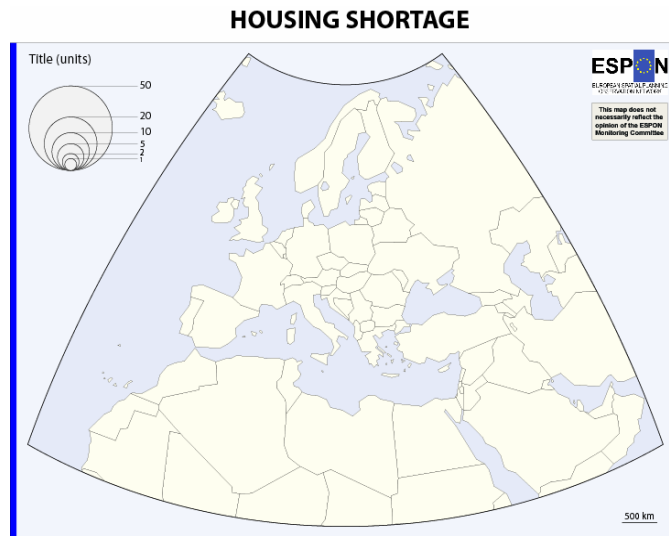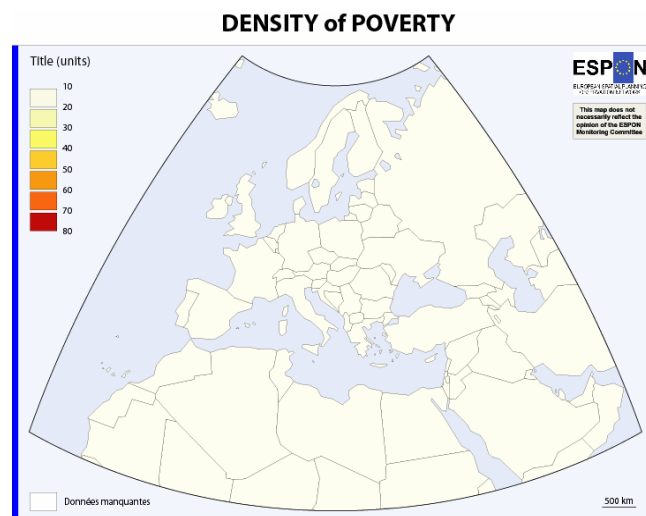
SOCIO-ECONOMIC GROUPING
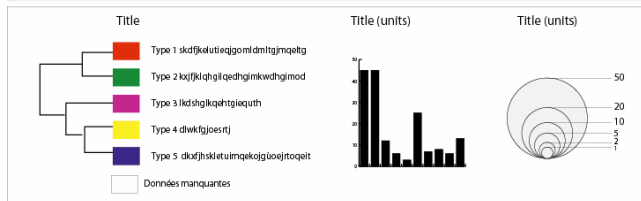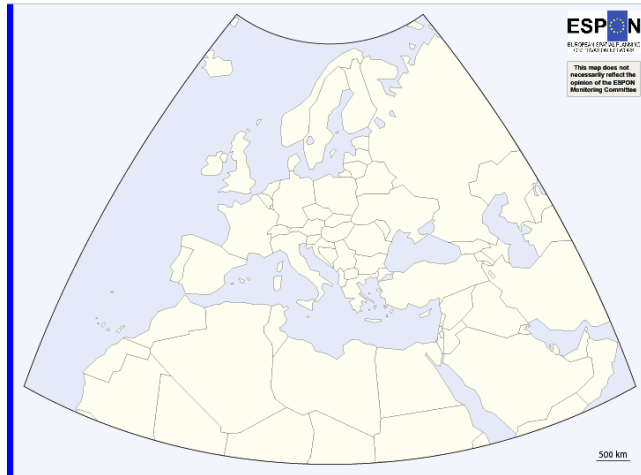
Title

- Type 1 skdfjkelutieqjgomldmltgjmqeltg
- Type 2 kxjfjkldhgilqedhgimkwdhgimod
- Type 3 lkdshglkqehtgiequth
- Type 4 dlwkfgjoesrtj
- Type 5 dlxfjhskletuimqekojgüoejrtoqeit

Données manquantes

Title (units)

Title (units)

50
20
10
5
2
1

POPULATION and DENSITY

Title (units)

50
20
10
5
2
1

Données manquantes

Title (units)

10
20
30
40
50
60
70
80
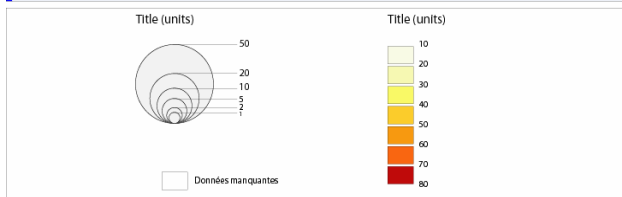
C.2.4.5 WORLD LAYOUT

Figure 23: 4 examples of world Layout
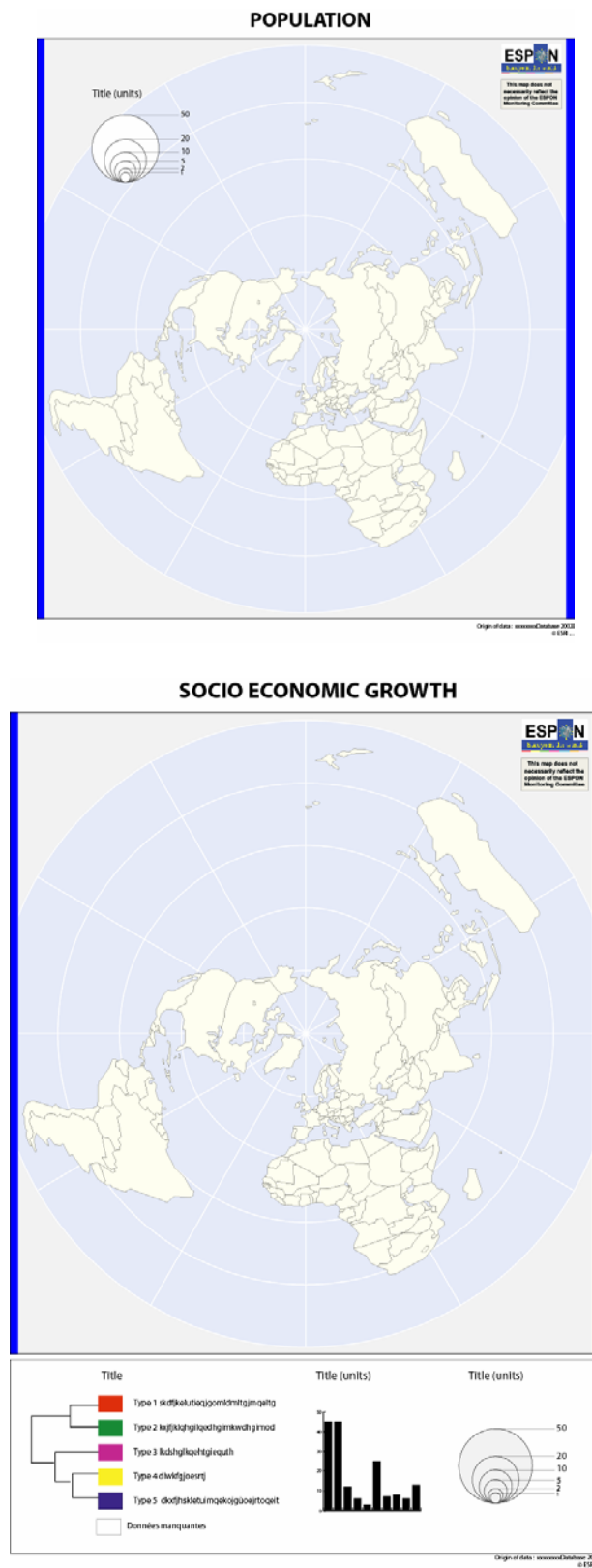
POPULATION DENSITY and MEDICAL COVER
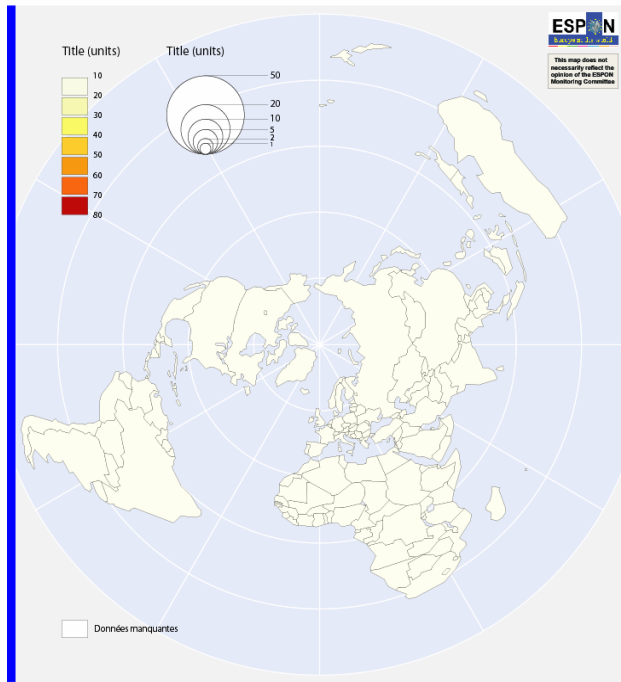
GDP and DENSITY
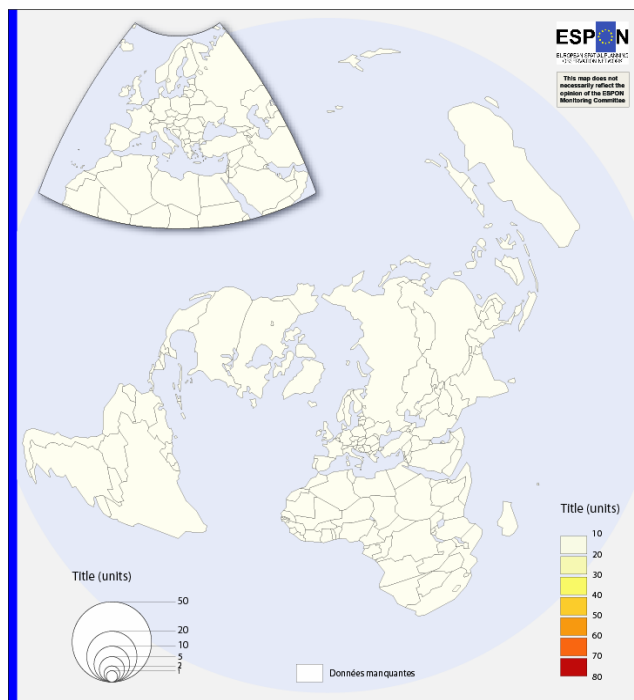
C.2.4.6 ESPON EU29 LAYOUT

Figure 24 : 2 examples of ESPON layout

POPULATION and DENSITY
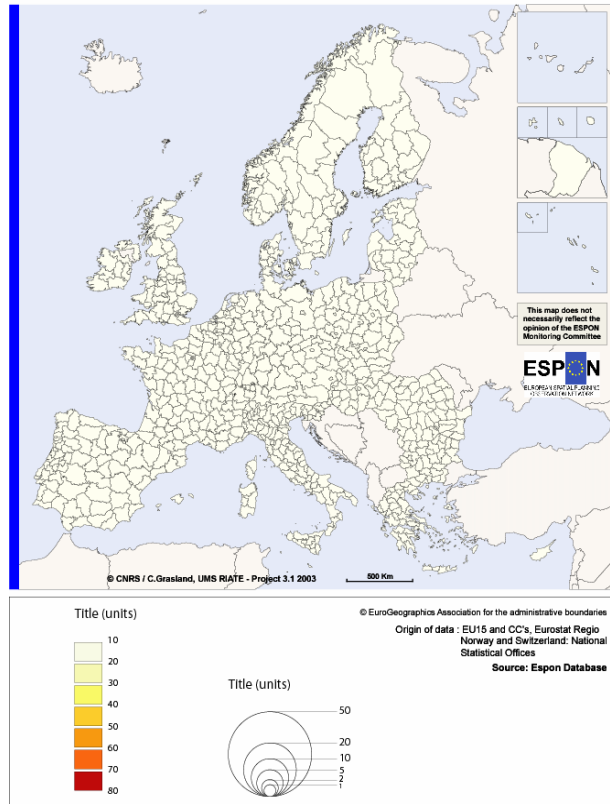
INSURANCE COVER
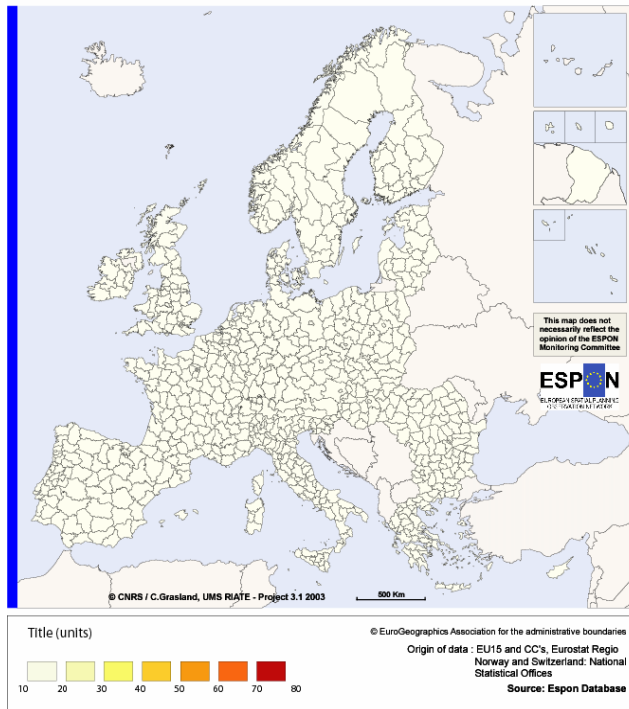
C.3 METHODOLOGICAL FRAMEWORK FOR THE ANALYSIS OF FLOWS AND STRUCTURES

Claude Grasland

This aim of this part (based on an annex of answer to the tender) is to illustrate the methodology which will be developed in WP6. To make the reading of this part easier, we have systematically take example of simple datasets of flows and structure related to 7 western Mediterranean countries (France, Spain, Italy, Morocco, Algeria, Tunisia and Libya).

C.3.1 PRELIMINARY SAMPLE OF METHODS FOR FLOWS ANALYSIS

It is not the place to define all possible methods which can be applied to the analysis of flows but it is important to give a first overview of the different interpretations and applications which can be derived from matrix flows in conceptual terms. To illustrate this, we will analyse a very simple sample matrix of trade flows between selected states from Northern and Southern Mediterranean that will be considered for simplicity as an isolated system. Normally, the rows define the origin of flows and the column their destination as in Table 9 where, for example the figure located in 1st row, 2nd column indicate that the average annual value of exportation from France to Italy was 27.6 billions of dollars during the time period 1996-2000.

Table 9 : Mean annual value of trade flows 1996-2000 (millions of US $)

Fij	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA	0	27626	24224	2145	2322	297	2103	58717
ITA	27446	0	12873	830	561	977	1564	44251
ESP	19739	9525	0	664	966	162	334	31391
ALG	1878	2137	1665	0	124	1	79	5884
MAR	2533	427	739	14	0	107	53	3873
LBY	467	4269	1199	2	58	0	241	6235
TUN	1640	1209	276	35	40	225	0	3425
Total	53703	45193	40976	3689	4071	1770	4374	153775

C.3.1.1 ABSOLUTE LEVEL OF FLOWS AND HIERARCHY

The hierarchy of flows in absolute terms is the first information to consider in the analysis. It is of course related to the size of territorial units which send (push factor) and receive (pull factor) but it has also a specific significance and can help to define a hierarchy of relations between territorial units. In the example of Table 1, this analysis of the magnitude of flows reveals a clear typology of relations of high magnitude between northern Mediterranean countries (10-30 billions of dollars), low magnitude between southern Mediterranean countries (less than 0.3 billions of dollars) and medium magnitude between northern and southern countries (0.5-5 billions of dollars).

The symmetry/asymmetry of flows is a topic of crucial importance for the political analysis of relation between territories. For this reason, the geographer W. Tobler has propose to transform systematically the initial matrix of flows **F** into a symmetric component **F+** which describe the sum of flows in both directions (Fij+Fji) and an asymmetric component **F-** which describe the difference between flows in both directions (Fij-Fji).

⇨ *The volume of relation* is described by Tobler's symmetric component of flows **F+** and defines the global level of connexion between both territorial units, under the consideration that, whatever the direction, a flow create a *non-oriented linkage*. In our example the most important volume of relation is observed between France and Italy and the less important between Algeria and Libya.

F+ij	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA	0	55072	43963	4023	4855	764	3743	112420
ITA	55072	0	22398	2967	988	5246	2773	89444
ESP	43963	22398	0	2329	1705	1361	610	72367
ALG	4023	2967	2329	0	138	3	114	9573
MAR	4855	988	1705	138	0	165	93	7944
LBY	764	5246	1361	3	165	0	466	8005
TUN	3743	2773	610	114	93	466	0	7799
Total	112420	89444	72367	9573	7944	8005	7799	307550

⇨ *The balance of relations is described by Tobler's asymmetric component of flows F- and defines the gains and loses* of a territorial unit in relation with another territorial unit. The matrix present symmetric values with opposite signs and create an *oriented linkage*. In our example, the most important differential in the commercial balance is observed between France and Spain, in favour of France (+4.9 Billions of dollars).

F-	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA	0	180	4485	267	-211	-170	463	5014
ITA	-180	0	3348	-1307	134	-3292	355	-942
ESP	-4485	-3348	0	-1001	227	-1037	58	-9585
ALG	-267	1307	1001	0	110	-1	44	2195
MAR	211	-134	-227	-110	0	49	13	-198
LBY	170	3292	1037	1	-49	0	16	4465
TUN	-463	-355	-58	-44	-13	-16	0	-949
Total	-5014	942	9585	-2195	198	-4465	949	0

⇨ *The directional asymmetry of relations* can be also described in relative terms by the index F-/F+ which is strictly comprise between -1 and +1. A negative value indicates that a territorial unit receive much more than he receives (as Morocco toward Algeria) and a positive value indicates the reverse situation (as Algeria toward Morocco). An index value equal or near to 0 indicates that the relations are more or less equal in both direction. The exchange between France and Spain which had the highest balance in previous analysis (±4.5 Billions of $) are in fact characterised by a low level of directional asymmetry (±0.10) as compare to the balance of exchanges between Morocco and Algeria which has a lower absolute value (±0.11 billions of $) but with a very high level of directional asymmetry (±0.76)

F+/F-	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA		0.003	0.102	0.066	-0.043	-0.223	0.124	0.045
ITA	-0.003		0.149	-0.441	0.136	-0.628	0.128	-0.011
ESP	-0.102	-0.149		-0.430	0.133	-0.762	0.095	-0.132
ALG	-0.066	0.441	0.430		0.797	-0.333	0.386	0.229
MAR	0.043	-0.136	-0.133	-0.797		0.297	0.140	-0.025
LBY	0.223	0.628	0.762	0.333	-0.297		0.034	0.558
TUN	-0.124	-0.128	-0.095	-0.386	-0.140	-0.034		-0.122
Total	-0.045	0.011	0.132	-0.229	0.025	-0.558	0.122	0.000

C.3.1.2 RELATIVE LEVEL OF FLOWS AND INFLUENCE

The analysis of flows in relative terms introduces a completely different type of analysis because the importance of flows is not evaluated from an external point of view but from the internal point of view of origins and destinations. The transformation which is applied consist in the division of each line (or column) of the matrix by the marginal sum. As an example, we will consider the analyse of the volume of relations between two states (F+) which is normally a symmetric linkage in absolute terms but which can produce very important asymmetry when it is analysed in relative terms.

The structural asymmetry of relation is related to the difference of size (capacity of import and export of units) which is fundamental for the definition of influence areas. In our isolated system, Morocco account for **4%** of France's volume of trade which is mainly linked with Italy (47%) and Spain (41%). But in the same time, France account for **65%** of Morocco's trade relation which has also secondary important relations with Spain (19%) and Italy (11%). This asymmetry is not related to the direction of flows (we have taken the example of the matrix F+) but to the structural difference of size between the partners of the relation. This structural asymmetry introduces a relation of power and dependency between the territorial units. Indeed, in the case of a commercial conflict between the two partners of the relation, one of them will be much more vulnerable than the other (respectively 4% and 65% of the trade relation to be reoriented toward other partners).

codei	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA		47%	41%	4%	4%	1%	4%	100%
ITA	62%		29%	2%	1%	2%	4%	100%
ESP	63%	30%		2%	3%	1%	1%	100%
ALG	32%	36%	28%		2%	0%	1%	100%
MAR	65%	11%	19%	0%		3%	1%	100%
LBY	7%	68%	19%	0%	1%		4%	100%
TUN	48%	35%	8%	1%	1%	7%		100%

The structural asymmetry of relations is strongly dependant from the spatial framework used for its computation. In previous example, we have neglected the relations between our isolated system and the rest of the World, which can produce false conclusions on the real level of dependency between the selected countries. For example, the structural influence of France on Tunisia is divided by 2 (48% to 27%) if we take into account the trade relations between Tunisia and the rest of the World. But we can notice that at the same time the small influence of Tunisia on France is divided by 5 (3.6% to 0.7%) because the northern Mediterranean countries like France are much more connected the rest of the World (70-80%

of their trade relations) than the southern Mediterranean countries (40-60% of their trade relations).

codei	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Rest of the world	Total
FRA	0%	10%	8%	1%	1%	0%	1%	79%	100%
ITA	13%	0%	5%	1%	0%	1%	1%	79%	100%
ESP	19%	10%	0%	1%	1%	1%	0%	69%	100%
ALG	17%	13%	10%	0%	1%	0%	0%	59%	100%
MAR	28%	6%	10%	1%	0%	1%	1%	54%	100%
LBY	5%	36%	9%	0%	1%	0%	3%	45%	100%
TUN	27%	20%	4%	1%	1%	3%	0%	43%	100%

C.3.1.3 OTHER MEASURES OF FLOWS INTENSITY

Measures of flows intensity can be produced by adding structural information out of the flow matrix. This topic is of special importance when the diagonal of the matrix of flows is not filled i.e. when the internal movement inside each territorial unit are not taken into account[7]. Many measures of flows **intensity** can be produced according to the nature of the flow and the assumption made by the observer of the relations. It is not possible to specify a general solution as it depends strongly on the type of flows which are analysed. For example the intensity of migratory flows can be divided by the population of territorial units (in- and out-migration rates) when the intensity of economic flows can be better related to the GDP of the territorial unit (dependency to external trends).

Modelling of flows according to various assumptions on structural factor determining the relations between states are certainly the most important topic as its aim is to go behind the simple description of relations toward their explanation and their simulation. A classical solution is the family of the gravity model of spatial interaction which propose to explain the flow Fij between two territorial units i and j by structural factors characterizing the origins, the destination and the distance between origin and destination. Many other variables can be added, as it will discuss in the following part on the concept of structure and the linkage approach.

C.3.2 PRELIMINARY SAMPLE OF METHODS FOR STRUCTURE ANALYSIS

As in the case of flows, we will not try here to define all possible methods which can be applied to the analysis of structures but it is important to give a first overview of the different interpretations and applications which can be derived from structural information in conceptual terms and how it can be linked to the analysis of flows. To illustrate this, we will analyse a very simple sample matrix of attributes of the previous sample of states from Northern and Southern Mediterranean. As in previous case, we consider for simplicity the 7 selected states as an isolated system.

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[7] Many mistakes in the interpretation of flows are related to this problem of lack of information on the internal moves of territorial units. For example, an analysis of *international* air flows can give the false impression that Europe plays a major role in air traffic at world scale, simply because the internal air traffic of United States is not taken into account

Table 10 : Structural characteristics of selected Mediterranean countries (1999)

Name	SUP	AGR	POP	BIR	GNP	GDP	CO2
France	552	195	59.1	709	1550	1130	391
Italy	301	109	57.7	519	1160	1040	436
Spain	506	192	39.4	355	571	555	251
Algeria	2382	80	30.8	924	46	91	102
Libya	1760	21	5.0	140	10	24	44
Morocco	447	96	28.2	649	36	102	30
Tunisia	164	49	9.5	209	20	50	17
Total	**6112**	**742**	**229.7**	**3505**	**3393**	**2992**	**1271**

Definition of variables	
SUP	Area in 1999 (thousands of km2)
AGR	Agriculture area in 1999 (thousands of km2)
POP	Population in 1999 (millions of inh.)
BIR	Birth Rate in 1999 (thousands of births)
GNP	Gross National Product in 1999 (in billions of US $)
GDP	Gross Domestic Product in 1999 (in billions of US $ p.p.a)
CO2	Carbon Dioxide Emission in 1998 (millions of tons)

C.3.2.1 SIZE AND HIERARCHY

The hierarchy of sizes of territorial units is the first dimension to introduce in structural analysis, whatever the family of criteria under consideration (economic, demographic and environmental). Size is defined by raw count variables ("stocks" of population, area, GDP…) which can be added and transformed into a proportion or rank of the system which is analysed for better comparability. Sizes define the potential influence of a given element in the system under consideration and are directly related to their ability to establish flows with the other elements of the system (push and pull factors). The choice of the size criteria should be made very carefully and clearly related to the problem to be analysed. For example, if we are interested on agricultural matters, the potential of states should be evaluated by agricultural area (where France and Italy represent 52% of the total) and not simple area (where Algeria and Libya represent 68% of the total). When several criteria are considered to be important for the elaboration of a synthetic index of size is a very complicated question because it is related to the selection of variables, to their possible transformation (rank, proportions, standardised values, …) and to the methodology used for the elaboration of the synthesis (arithmetic mean, weighted mean, factorial analysis, …).

For example, the size of Libya appears greater than the size of Tunisia when we use the methodology of the mean proportion on all criteria (because Libya has a very larger area) but the situation is reversed when we consider the mean rank on all criteria (because Tunisia has better ranks on most criteria).

Size as proportion of the whole system

Name	SUP	AGR	POP	BIR	GNP	GDP	CO2	mean
France	9%	26%	26%	20%	46%	38%	31%	**28%**
Italy	5%	15%	25%	15%	34%	35%	34%	**23%**
Spain	8%	26%	17%	10%	17%	19%	20%	**17%**
Algeria	39%	11%	13%	26%	1%	3%	8%	**15%**
Libya	29%	3%	2%	4%	0%	1%	3%	**6%**
Morocco	7%	13%	12%	19%	1%	3%	2%	**8%**
Tunisia	3%	7%	4%	6%	1%	2%	1%	**3%**
Total	100%	100%	100%	100%	100%	100%	100%	**100%**

Size as rank of elementary spatial units

Name	SUP	AGR	POP	BIR	GNP	GDP	CO2	mean
France	3	1	1	2	1	1	2	**1.6**
Italy	6	3	2	4	2	2	1	**2.9**
Spain	4	2	3	5	3	3	3	**3.3**
Algeria	1	5	4	1	4	5	4	**3.4**
Libya	2	7	7	7	7	7	5	**6.0**
Morocco	5	4	5	3	5	4	6	**4.6**
Tunisia	7	6	6	6	6	6	7	**6.3**

It is of crucial importance to notice that size can not always been reduced to a single dimension when several criteria are taken into consideration. In many cases, it is necessary to consider size in a multidimensional way according to the groups of correlation between attributes defining the size of the units. In our example, the 1st factor of a Principal Component analysis define a global size of states on the criteria of Population, GDP, GNP, Agriculture area and CO2 emissions. But this factor account only for 68% of the initial information and a second factor define a secondary component of size which is rather related to birth rate and area of states and ads complements for 19% of the initial information. Typically, Algeria has a medium score on the first dimension but a very high level on the second one.

Size as multivariate dimension

Principal Component Analysis of Sizes (axes F1 et F2 : 88 %)
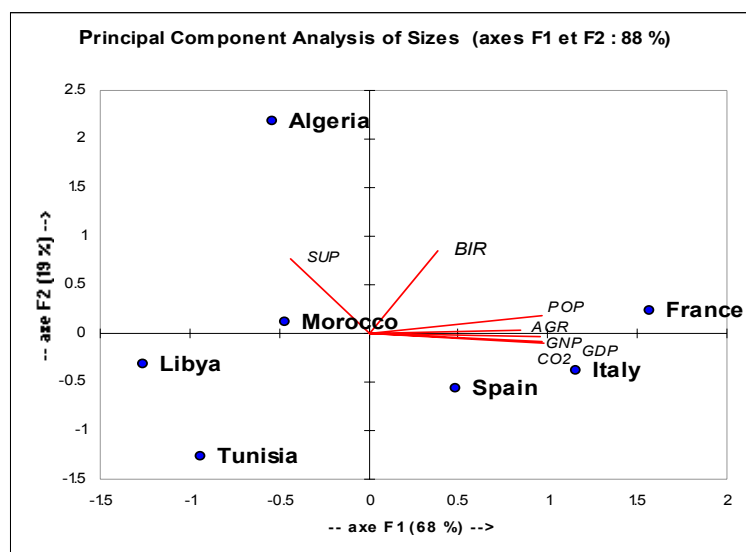
C.3.2.2 DISSIMILARITY AND IDENTITY

The analysis of similarities/dissimilarities between economic, social and environmental structures of the territorial units defines a second field of investigation where the attributes are not necessary related to size and will rather focus on the relative intensity of the factors, all things being equal with the size of the territorial units[8]. As an example, we will consider a set of variables which are ratio between initial variables describing the size of territorial units and where the initial size effect has been formally removed. The variables which have been selected in various fields normally result from the work of an expert which will choose the most relevant index, according to the phenomena under consideration and the political demand to be addressed. In our example, a specialist of demography can consider that simple population density (DEN1) is not sufficient because many states like Libya and Algeria has whole part of their territory with desert areas. Therefore, the expert could provide an additional index which is a proxy of net density based on the ratio between population and agricultural area (DEN2). The same is true in the case of economics where the expert can consider that two different measures of wealth per inhabitant introduce complementary information (ECO1, ECO2). And finally, the environmental expert can propose two different measures of the consumption of CO_2 according to the fact that one focus on a social approach (ENV1) or an economic approach (ENV2) of the problem of pollution.

Table 11 : Selected demographic, economic and environmental characteristic ratios

Name	DEM1	DEM2	DEM3	ECO1	ECO2	ENV1	ENV2
France	107	303	12	26200	19100	6.6	0.35
Italy	192	529	9	20100	18000	7.6	0.42
Spain	78	205	9	14500	14100	6.4	0.45
Algeria	13	385	30	1500	3000	3.3	1.12
Libya	3	238	28	2000	4800	8.8	1.83
Morocco	63	294	23	1300	3600	1.1	0.29
Tunisia	58	194	22	2100	5300	1.8	0.34
West. Medit.	**38**	**310**	**15**	**14800**	**13000**	**5.5**	**0.42**

Definition of variables	
DEM1	Gross population density in inh/km2 (POP/SUP)
DEM2	Net population density in inh/km2 (POP/AGR)
DEM3	Birth rate (BIR/POP)
ECO1	GNP in $ per inhabitant (GNP/POP)
ECO2	GDP in p.p.a per inhabitant (GDP/POP)
ENV1	CO2 in tons per inhabitant (CO2/POP)
ENV2	CO2 in kg per $ of GDP (CO2/GDP)

As in the case of the analysis of size, it is possible to introduce many transformations in the initial table (rank, standardisation…) and we do not further develop the crucial importance of this step but insist on the fact that it can heavily modify the following results of the analysis. We would rather insist on the fact that they are two complementary ways for the analysis of such a table, according to the fact that the focus is made on the variables (correlation) or the territorial units (similarities). Each type of analysis produces different output which has different applications for political decision in the ESPON program.

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[8] But it is not an absolute rule and, in certain cases, factors related to size and relative intensity of phenomena can be combined together in the same analysis.

⇨ **Correlation analysis** focuses on the analysis of dependencies between variables describing the territorial units in order to propose more synthetic parameters like factors which summarise the initial formation in a more synthetic way. In the sample of data on Mediterranean countries it is possible to identify more or less trivial relations: it is obvious that the two measures of GDP/inhabitants are highly positively correlated (+0.99) and has a negative correlation with the birth rate (-0.86 and –0.92); but less trivial relations can be noticed as in the case of gross population density which is correlated with the previous variable which is not the case of net population density. The lack of significant relation between the environmental variables and the economic and demographic parameters is also interesting, even if it is partly related to the small size of the sample.

	DEM1	DEM2	DEM3	ECO1	ECO2	ENV1	ENV2
DEM1	1	0.618	**-0.841**	**0.765**	**0.815**	0.251	-0.643
DEM2	0.618	1	-0.212	0.353	0.349	0.209	-0.085
DEM3	**-0.841**	-0.212	1	**-0.864**	**-0.919**	-0.376	0.641
ECO1	**0.765**	0.353	**-0.864**	1	**0.986**	0.540	-0.438
ECO2	**0.815**	0.349	**-0.919**	**0.986**	1	0.573	-0.448
ENV1	0.251	0.209	-0.376	0.540	0.573	1	0.452
ENV2	-0.643	-0.085	0.641	-0.438	-0.448	0.452	1

in black, values significant at level alpha=0.05 (bilateral test)

As in the previous case of the analysis of the size variables, the factorial analysis is very helpful for summarizing the correlation matrix in order to propose more global factors of spatial differentiation. In our example, a first factor is defined by the combination of economic and demographic variables with a clear opposition between northern and southern Mediterranean countries. But the environmental dimension (emissions of CO_2 per inhabitants or $) reveals another opposition between southern Mediterranean countries with an economy based on oil resources (Libya, Algeria) and countries with a different industrial basis (Tunisia, Morocco).


Principle component analysis of economic, social end environmental dimensions (axes F1 et F2 : 84 %)
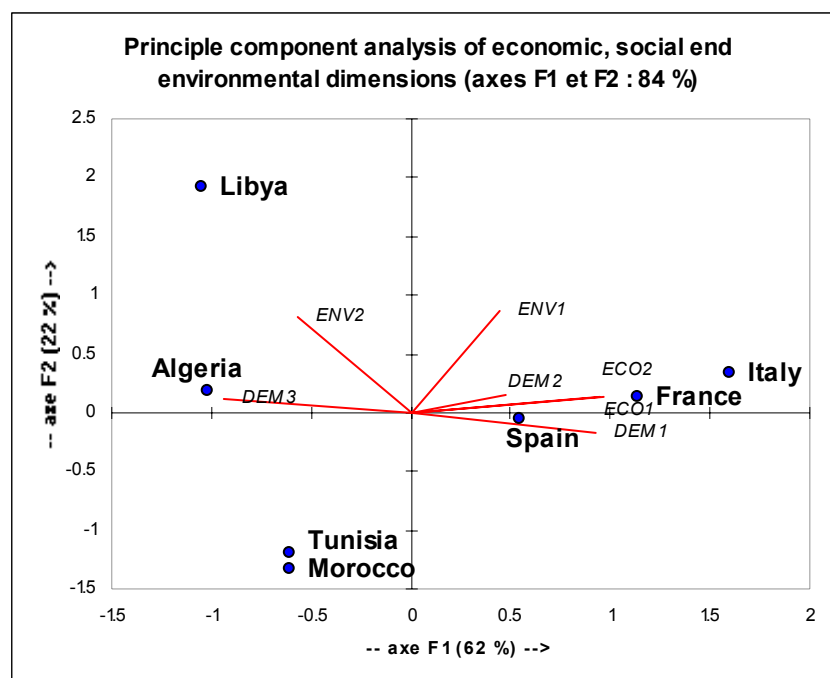
⇨ **Similarity analysis** focus on the differences between state which can be expressed by a typology (cluster analysis) but can also provide a very previous information on linkage between states through the elaboration of a similarity matrix between states which can be directly connected to other linkage matrixes, as we will see in next section. In our example, the dissimilarity matrix[9] reveals a very strong pattern of opposition between two groups of states located in North and South of the Mediterranean See. But they are some exceptions, like in the case of Spain which has a higher level of dissimilarity with Italy (3.68) than with Morocco (3.43) or Tunisia (2.97). Libya is also very different from Morocco (4.20) and Tunisia (3.96) but difference are also very strong with northern countries. The related classification tree[10] confirms the strong opposition between the two groups of states and introduces some minor differences inside northern group (Italy / France & Spain) and southern group (Algeria & Libya / Morocco and Tunisia).

Dissimilarity matrix

	Frau	Ita	Spa	Alg	Lib	Mor	Tun
France	0.00	2.66	1.81	4.89	5.15	4.30	4.10
Italy	2.66	0.00	3.66	5.52	6.12	5.14	5.35
Spain	1.81	3.66	0.00	4.22	4.25	3.43	2.97
Algeria	4.89	5.52	4.22	0.00	2.76	2.28	2.67
Libya	5.15	6.12	4.25	2.76	0.00	4.20	3.96
Morocco	4.30	5.14	3.43	2.28	4.20	0.00	1.00
Tunisia	4.10	5.35	2.97	2.67	3.96	1.00	0.00

Classification tree

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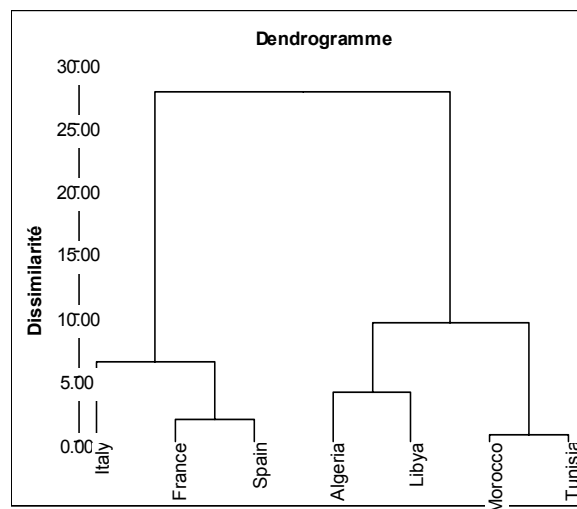
[9] Based on the classical Euclidean distance between standardised variables.
[10] Based *on Ward's criteria applied to Euclidean distance between standardised values*

C.3.2.3 DIFFERENCES AND COMPLEMENTARITY

The analysis of differences (or gradient) is statistically very near from the previous topic of dissimilarities but is conceptually very different because it introduces an asymmetric dimension in the analysis of the structural relations between states. As we have seen before, the *dissimilarity* is a symmetric linkage where the value which describe the link between 2 territorial units i and j is equal to the value which define the link between j and i. In the case of *differences*, the relation is asymmetric and the relation between i and j is the opposite (or the inverse) of the relation between j and i. This crucial difference can be explained through the simple example of the differences of GNP/inhabitants between the sample of Mediterranean countries.

⇨ The *absolute differences* can be measure in a very simple way as the arithmetic difference between the territorial units. For this criteria, the difference of GNP/inh between France and Italy (±6100 $/inh.) is considered as much more important than the difference between Tunisia and Algeria (±600 $/inh).

Xi-Xj	Fra	Ita	Spa	Alg	Lib	Mor	Tun
France	0	6100	11700	24700	24200	24900	24100
Italy	-6100	0	5600	18600	18100	18800	18000
Spain	-11700	-5600	0	13000	12500	13200	12400
Algeria	-24700	-18600	-13000	0	-500	200	-600
Libya	-24200	-18100	-12500	500	0	700	-100
Morocco	-24900	-18800	-13200	-200	-700	0	-800
Tunisia	-24100	-18000	-12400	600	100	800	0

⇨ The *relative differences* take into account the relative level of GNP/inh. or the couple of state and can be measure in a very simple way as the ratio of the value of the indicator for each couple of territorial units. For this criteria, the difference of GNP/inh between France and Italy (1.3.) is considered as much more important than the difference between Tunisia and Algeria (±600 $/inh).

Whatever their method of evaluation, matrix of differences are a crucial structural component for the analysis of flows because they define opportunities of relation related to the concept of **complementarity**. It is conceptually very different from the matrix of dissimilarities which can also have an effect on flows but are rather related to the concept of **identity**.

C.3.2.4 SPATIAL PROXIMITY: GEOGRAPHICAL NEIGHBOURHOOD AND NETWORK ACCESSIBILITY

The various measure of **spatial proximity** can also be considered as structure as far as they determine in several ways the possibility of flows between territorial units according to time or cost of relation. It is not the place to develop in detail the various measure of spatial proximity which can be introduced in the analysis of the position of Europe in the World but it is important to make a clear distinction between two very different forms of structural links according to the fact that they define a continuous (geographical neighbourhood) or discontinuous (network accessibility) approach of space.

Geographical neighbourhood can be defined as information which is mainly related to the geometry of spatial units and based on the existence of common borders (contiguity) or the

physical distance in kilometres between various points of the area of each territorial unit. The geographic definition of European neighbours under geographical criteria is not trivial as it can be seen on the example proposed in Figure 1. If we use a map with a low level of spatial resolution –indicating only the main area without small islands or territories located out of the main territorial body of each state – we will eliminate many case of contiguity between territorial units. For example the common border between Spain and Morocco through Ceuta and Melilla or the common border between Russia and Poland or Lithuania through the district of Kaliningrad. In certain cases, the question is not only technical but also political as in the case of the definition of contiguity between Cyprus and Turkey which would be, *de facto*, recognition of the occupation of the northern part of the island… The existence of a common border between two states is a very fundamental topic for many types of flows (e.g. juridical consequence of unofficial migrations toward the territories of Ceuta and Melilla) but it is also very symbolic information which modifies the representations of people and policymakers. We have limited here our example to the case of the pan-European area but it is obvious that the question should be analysed in a world wide perspective in ESPON 341 because many states of Europe (in particular France and UK) has remote territories which create geographical neighbourhood between EU and many other continents (e.g. contiguity between France and south American countries through the French department of Guyana).

Figure 25 : Common border between states in pan-European area
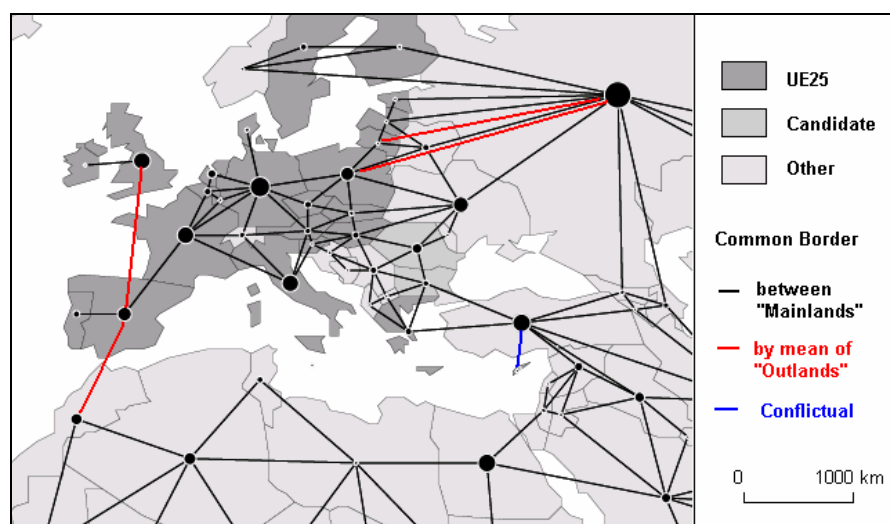
The question of the definition of contiguities has also important consequences on the cartography of structure. If we decide, for example, to produce a map of relative discontinuities of GNP/inh. at international level (*Figure 2*) we will produce a map where important discontinuities can be pointed in central and eastern part of Europe (e.g. between Finland and Russia) but we will not provide any information on the discontinuities which exist between northern and southern coast of the Mediterranean See and are of comparable importance, as we have seen in the previous section. We will neither sea the discontinuities of wealth between European Union and the Balkan countries, despite the high level of flows which are related to this structure (e.g. migrations between Albania and Italy).

Figure 26 : Discontinuities of GNP/inh. between states along terrestrial borders
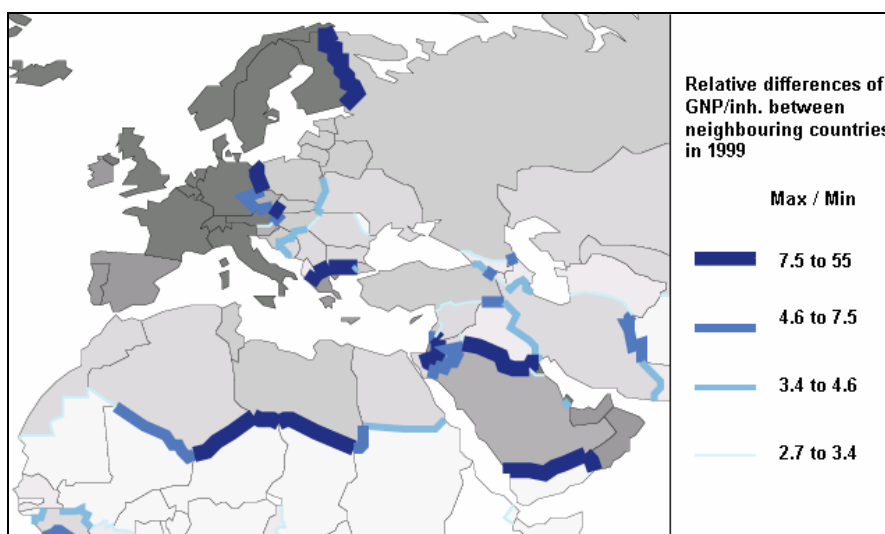
In this situation it is of utmost importance to propose other measures of geographical proximity, based for example on the minimum distance between the borders of states separated by sea and to consider that the neighbourhood exist if the minimum distance is lower than a given threshold (e.g. 50 or 100 km) and if the sea can be crossed easily. But we see that, in this situation, the geographical neighbourhood is not based only on geometry and take into account other information on the possibility for migratory flows to cross channels which mean that we are in fact introducing a proxy of the concept of network accessibility.

Network accessibility is not based on a hypothetical effect of physical distance but introduce explicit assumptions on the technical or practical solutions which contribute to the realisation of flows between territories. According to the nature of flows which are considered of interest, various form of network accessibility can be defined related for example to different modes of transportation (air, rail, road…) and their possible connexion in multimodal networks. In the framework of the limited budget of ESPON project 3.4.1, it will probably not be possible to analyse this point in too much details but it is important to keep in mind that network accessibility does not exist without consideration of the flows which can be related to a particular infrastructure of communication. It is also of utmost importance to introduce a social dimension in the measure of network accessibility because all types of networks can not be used by all social groups according to their resource or knowledge (e.g. internet).

From conceptual point of view, network accessibility is fundamentally different from geographical neighbourhood because it is often related to connexion between nodes which are located in a discontinuous space (e.g. gateway cities). It is related to difficult questions concerning the scale of analysis, the basic territorial units of the study. Indeed, the fact that a state has a good airport connexion in a given point of his territory does not mean that all other parts of the territory of this state can benefit from this infrastructure, depending on internal networks which connect secondary centres to the main Hub. Reversely, a State which does not have a good airport on his own territory can benefit from the infrastructure of other neighbouring states, at less in the border area.

Geographical neighbourhood and network accessibility are complementary structure which should both be taken into account if we want to get a sound interpretation of flows between Europe and the rest of the World

C.3.3 PRELIMINARY SAMPLE OF METHODS FOR SYNTHETIC ANALYSIS

We will now briefly explain how the various types of synthesis can be made, without going in too many details.

C.3.3.1 THEMATIC SYNTHESIS

Thematic synthesis on a particular field will be based on the use of models who integrates flows and structure in a systemic way. As a very simple example, we will illustrate the methodology of gravity model of spatial interaction applied to the economic exchanges between northern and southern Mediterranean states which has been previously analysed.

We propose to estimate the trade flows (Fij) between two states as a function of the economic capacity described by the GNP of the country of origin (GNPi) and the GNP of the country of destination (GNPj). We introduce also an assumption on the role of geographical distance (Dij) and geographical neighbourhood described by the presence of a common border (Cij). The structure of the model is a classical gravity assumption that:

$$F_{ij} = \alpha . (GNPi)^{\beta 1} . (GNPj)^{\beta 2} . (Dij)^{\gamma} . \delta^{(Cij)}$$

The parameters are estimated by linear regression after logarithmic transformation:

$$Log(Fij) = a0 + a1.log(GNPi) + a2 \log(GNPj) + a3 \log(Dij) + a4.Cij$$
=> With α= exp(a0) ; β1=a1 ; β2=a2 ; γ=a3 ; δ=exp(a4)

The analysis of the results of multiple regression indicates that both push and pull factors (GNPi and GNPj) has significant positive effect on the level of trade flows between partner state but not the geographical distance (Dij) and the geographical neighbourhood (Cij) which do not appears to have a significant influence of trade flows between the set of countries which has been selected. The value of geographical parameter indicate that the presence of a common border has a slow positive effect on trade flows (+36%) but it is not significant has it is not a regular result. More surprisingly, distance appears to have a small positive effect, which means that trade increase when distance increases, which is very unusual but can be explained by the relative homogeneity of distance and the fact that we have use a very rough definition of proximity (Euclidean distance between geometrical centres of states). As we will see later, this contradiction is related to a bad specification of distance.

The proposed model explains 72% of the variation of flows between states but let unexplained 28% of the initial information on trade flows. The analysis of the residuals of the model is therefore a very interesting way for the discovery of other explanatory variables which has been introduced in the initial formulation of the model. Absolute residuals are computed as the difference between observed and predicted flows and relative residuals as the ratio between observed and predicted flows (see. below)

Observed trade flows

Fij	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA		27626	24224	2145	2322	297	2103	58717
ITA	27446		12873	830	561	977	1564	44251
ESP	19739	9525		664	966	162	334	31390
ALG	1878	2137	1665		124	1	79	5884
MAR	2533	427	739	14		107	53	3873
LBY	467	4269	1199	2	58		241	6236
TUN	1640	1209	276	35	40	225		3425
Total	53703	45193	40976	3690	4071	1769	4374	153776

Expected trade flows

F*ij	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA		36728	20346	1479	431	1255	725	60964
ITA	37274		8682	1173	355	956	546	48986
ESP	21409	9001		666	379	589	338	32382
ALG	1769	1383	757		57	83	98	4147
MAR	558	452	465	62		28	17	1582
LBY	1520	1141	678	84	26		83	3532
TUN	905	672	401	102	16	86		2182
Total	63435	49377	31329	3566	1264	2997	1807	153775

*Absolute residuals (Fij – F*ij)*

F*ij	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA		-9102	3878	666	1891	-958	1378	-2247
ITA	-9828		4191	-343	206	21	1018	-4735
ESP	-1670	524		-2	587	-427	-4	-992
ALG	109	754	908		67	-82	-19	1737
MAR	1975	-25	274	-48		79	36	2291
LBY	-1053	3128	521	-82	32		158	2704
TUN	735	537	-125	-67	24	139		1243
Total	-9732	-4184	9647	124	2807	-1228	2567	0

*Relative residuals (Fij/F*ij)*

Fij	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA		0.75	1.19	1.45	5.39	0.24	2.90	0.96
ITA	0.74		1.48	0.71	1.58	1.02	2.86	0.90
ESP	0.92	1.06		1.00	2.55	0.28	0.99	0.97
ALG	1.06	1.55	2.20		2.18	0.01	0.81	1.42
MAR	4.54	0.94	1.59	0.23		3.82	3.12	2.45
LBY	0.31	3.74	1.77	0.02	2.23		2.90	1.77
TUN	1.81	1.80	0.69	0.34	2.50	2.62		1.57
Total	0.85	0.92	1.31	1.03	3.22	0.59	2.42	1.00

⇨ *The analysis of the margin of the matrix of residual* indicates firstly that some states are more involved in the trade of the area than other. For example, we can notice that northern Mediterranean countries export less than expected with other countries selected when southern countries export much more than expected. The situation is not exactly the same for importation where we can notice exception to the previous rule (Spain, Libya).

⇨ *The analysis of the internal part of the matrix of residuals* reveals specific linkages between couples of states which have significant positive or negative residuals, indicating preferences or barriers effects according to the variables introduced in the model. For example, if we focus on north-south trade relations, we can observe that France has significant positive residuals in both directions with Morocco, Tunisia and at a less degree Algeria (only for exportation) but negative residuals with Libya. Italy has significant positive residuals in both direction with Tunisia and at a less degree with Libya and Algeria (only for importation) and Morocco (only for exportation). Spain has positive residuals with Morocco in both directions and at a less degree with Algeria and Libya (only for importations). The analysis of residuals suggest very clearly missing variables in the model like historical heritage related to colonisation (France with Maghreb and Italia with Libya) or common language (France and Maghreb). It can also reveals some misspecification in the parameter introduced in the model like geographical distance which has been measured as distance between gravity centre of area but would be better described by minimum distance between external borders (explaining therefore the intensity of relations between Italy and Tunisia or Spain and Morocco).

This example indicate clearly how the step of joint modelling of flows and structure help to discover hidden factors and suggest connexion with other thematic fields of interest for a better estimation of the model which can be improved and calibrated in a hypothetico-deductive process.

C.3.3.2 STRUCTURAL SYNTHESIS

This point will not be developed as most methods for joint analysis of several thematic structures are similar to the methods which have been presented for the analysis of a single structure (see. B.2). Multivariate analysis (factorial analysis, classification, similarity, discontinuity can be either applied to a homogeneous table of economic variables or to a table combining social, economical, demographical and environmental data.

The only point to precise is the mathematical type of variables introduced in the analysis (quantitative, qualitative, ordinal…) because it can modify the choice of the most relevant statistical tools to be applied to structural analysis. For example, if we want to analyse the correlation between the qualitative variable "*Belonging to EU*" and other quantitative variables we will not use classical correlation or regression model but variance analysis. For example, the variance analysis indicates clearly the existence of a very significant opposition between and northern and southern Mediterranean countries on the criteria of economic development measured by GNP/inh (90% of variance explained, significant at level 0.001). But this opposition is not systematic and, for example, it is not possible to define a significant north-south opposition on the criteria of ecological efficiency measured by CO_2 per \$ of GNP (20% of variance explained, non statistically significant). In this case, the real opposition is rather between countries with oil production (Libya, Algeria) with emission of CO_2 per \$ and all other countries of the area.

Relation between economic development (GNP/inh.) and belonging to EU.

Source	ddl	SSQ	Mean Square	F - Fisher	Pr > F
Model	1.000	589360119	589360119	42.748	0.001
Residual	5.000	68934167	13786833		
Total	6.000	658294286			

r2 = 90%

Relation between Ecological efficiency (CO2/GNP) and belonging to EU.

Source	ddl	SSQ	Mean Square	F - Fisher	Pr > F
Model	1.000	0.409	0.409	1.274	0.310
Residual	5.000	1.604	0.321		
Total	6.000	2.013			

r2 = 20%

Many ideas for structural synthesis are related to the research on synthetic indexes of human or sustainable development which are actually analysed in ESPON 3.2 in the work packages related to the construction of a European Territorial Cohesion Index. Therefore, the TPG ESPON 3.4.1 will take benefit from this existing material in order to gain complementarity between the different parts of the whole ESPON program.

C.3.3.3 FLOWS SYNTHESIS

As it was explained in part B.1, the various type of flows are not independent from each other and correlation or causal relation can be established between various types of flows which link states together. The synthesis of various types of flows is not necessary difficult if the methodology used by the different partners in charge of the various thematic flows is made similar and coherent at the very beginning. As they are many solutions for the transformation of initial matrix of flows (*see B.1*), it is crucial to introduce common methodology and common indexes in all work packages, even if some adding methodologies and variables should be applied on particular types of flows (like air connexion). It is obvious that the elaboration of a cross-thematic database of flows, which is a main concern of project ESPON 3.4.1. will introduce a sensible reduction of the initial information because, for example, the territorial units available in each matrix of flows will not be exactly the same and because the elaboration of a common territorial breakdowns will oblige to reduce the spatial resolution of the analysis.

As an example, the analysis of air connexions should normally be realised at city or airport level in a first step, but data will be further aggregated at national level in order to be combined with economic or migratory flows which can not be obtained at city level.

The same problem will appear in the case of introduction of an historical dimension in the analysis of a given type of flow. As limits of states are changing through time and that many states has been broken in several others after 1989 (Soviet Union, Yugoslavia, Czechoslovakia…) it will not be possible to introduce any historical dimension in the analysis of flows without geographical aggregation of territorial units. In certain cases, it is possible to try a reconstitution of past flows in new borders but is very expensive and impossible as regard to the limited resources available in ESPON 3.4.1. In certain cases, it is only between very big aggregates of world region that it is possible to proceed to such evaluation of flows through time.

In many cases, due to lack of information (holes in matrixes of flows) and difficulty to harmonise various types of criteria, will we limit our synthesis to the comparison of

qualitative variables indicating if flows are, for example "High", "Medium" or "Low". Those typologies introduce a dramatic reduction of initial information but are probably the most efficient solution for cross-thematic synthesis of flows in the context of our project.

In our Mediterranean example, we have seen that it was relatively easy to distinguish three levels of trade flows, because of strong discontinuities in the statistical distribution[11]. According to the level of bilateral commercial exchanges (*Trade*), we can associate to each couple of origin and destination a qualitative value according to level of flows. We do the same for two other matrixes of flows describing the number of air passengers between states (*Air1*) and the number of couples of cities connected by a minimum number of passengers (*Air2*)[12]. As variables are strongly correlated, it is relatively easy to define a global synthesis, except in particular case where we can observe a heterogeneous combination of high and low flows (e.g. France and Libya with low level of commercial trade but high level of air connexions).

Synthesis of three types of flows between Mediterranean countries

Origin/Dest.		Quantitative flows			Qualitative flows			Flows
I	j	Trade	Air1	Air2	Trade	Air1	Air2	synthesis
FRA	ITA	55072	5494041	284	3	3	3	**3**
FRA	ESP	43963	5052059	288	3	3	3	**3**
FRA	ALG	4023	1448096	42	2	3	3	**3**
FRA	MAR	4855	3144	4	2	1	2	**2**
FRA	LBY	764	2121522	79	1	3	3	**2***
FRA	TUN	3743	2656246	67	2	3	3	**3**
ITA	FRA	55072	5494041	284	3	3	3	**3**
…	…	…	…	…	…	…	…	**…**
…	…	…	…	…	…	…	…	**…**
LBY	TUN	466	53002	2	1	1	1	**1**
TUN	FRA	3743	2656246	67	2	3	3	**3**
TUN	ITA	2773	105502	10	2	2	2	**2**
TUN	ESP	610	213556	24	1	2	2	**2**
TUN	ALG	114	0	0	1	1	1	**1**
TUN	MAR	93	0	0	1	1	1	**1**
TUN	LBY	466	53002	2	1	1	1	**1**

Trade = bilateral commercial flows; Air1 = number of passengers; Air2 = number of city connexions
3 = Main flows; 2= Medium Flows; 1 = Small Flows; * indicate a mixture of high and low flows.
Qualitative transformation is based on statistical discontinuities in the distribution of each type of flow

It is now easy to propose a synthetic analysis of flows between Mediterranean countries which can be represent in matrix or graphic form.

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[11] Many statistical methods like Jenk's algorithm can help in the objective determination of typologies of quantitative variables, but it is also important to take into account the expert advices on each subject.
[12] Notice that the introduction of this variable help to limit the lose of information introduced by the aggregation of flows between airport at state level.

Synthesis of air and trade flows between selected western Mediterranean countries

nt.	FRA	ITA	ESP	ALG	MAR	LBY	TUN	Total
FRA		3	3	3	2	2	3	16
ITA	3		3	2	1	2	2	13
ESP	3	3		2	1	2	2	13
ALG	3	2	2		1	1	1	10
MAR	2	1	1	1		1	1	7
LBY	2	2	2	1	1		1	9
TUN	3	2	2	1	1	1		10
Total	16	13	13	10	7	9	10	78
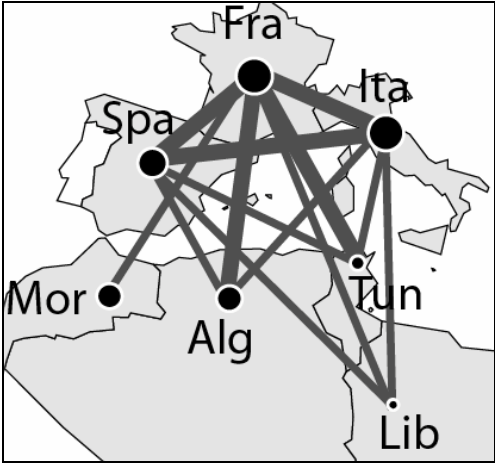
The synthetic pattern of flows which is derived from the synthesis demonstrate clearly a high level of integration between northern Mediterranean countries which are connected by high level of flows on all criteria and, reversely, the lack of integration between southern Mediterranean countries which has always low level of flows in their relation to each other. Concerning north-south relations, the major role is played by France which has high level of flows with Algeria and Tunisia and medium level of flows with Morocco and Libya. Italy and Spain has a medium level of relation with all southern Mediterranean countries, except Morocco which appears as the less connected to the rest of the area for the selected criteria of flows (trade and air connexions). Those results are not surprising but they illustrate the way we propose to deliver relatively simple and synthetic messages, useful for political decisions.

C.4 METHODOLOGY FOR A DICTIONARY OF CONCEPTS

C.4.1 CONSTRUCTION OF THE DICTIONARY OF CONCEPTS:

The aim of the dictionary of concept is to give an internal coherence to the project between all teams, to help a better understanding of the report for exterior people (glossary) and too allow a scientific debate on concepts during the elaboration (launch discussion on concepts).
The dictionary of concept is politically sensitive. We have not to follow the politic definitions but we must be aware of the way the words are used in the political context.

The glossary of the 3.1 glossary is used as a starting point for the elaboration of concept. The dictionary will be not organised in a hierarchical way, but it is necessary to make as much links as possible between concepts.

To have an example of what is possible you can have a look at this online hypertext encyclopaedia on geography: http://www.cybergeo.presse.fr/libergeo/hypergeo.htm

Concerning the practical construction of the dictionary, we'll use as much as possible interactive tools in a "wikipedia" way if possible. The tool will be set up for the end of February.

The structure of the concept definition will be the following one:
- Concept
- Definition
- List of references
- Links to key questions

C.4.2 THE PROVISORY LIST OF CONCEPT IS THE FOLLOWING ONE:

From ESPON 3.1.: Accessibility, barrier effect, border area/region, centre/periphery, cohesion, competitiveness, connectivity, core area, environment, functional urban area, gateway, global integration zone, hub, information network, metropolitan area, node, polycentric development, scale/level, territorial spatial cohesion, territorial spatial integration, transnational cooperation, global urban area.

Others : European neighbourhood, globalisation, free trade agreement (?), trade blocks (?), custom union (?), influence area, global city, border, archipelago, international division of labour, international division of production, value chain, mac donaldisation.

C.4.3 EXAMPLE OF FIRST DEFINITIONS OF CONCEPTS USED IN THE FRAMEWORK OF A CASE STUDY: EUROPE IN ITS NEIGHBOURHOOD.

C.4.3.1 "REGION":

The concept of **region** is a tricky one for several reasons. It can be used at different levels and it can be defined in several ways (is it based on territorial continuity or on connexity for example?). There are political or administrative regions, homogeneous regions (cultural, natural regions, etc…), functional regions (economic regions for example), and so on. In the frame of a reflection about the place and role of Europe in the world and, reversely, about the role of the role of the world in Europe, the notion of region can be addressed in several ways and at several scales. It has a:

- Formal **political** meaning: Commercial Agreements. The latter is not easy to define. What is there in common between the variations of the Mercosur area that could encompass the all Southern America in the future and the EU, which is much more integrated but which is not a Union yet? Even between the various commercial agreements, what is common to the free trade zones, the union customs and the common markets?

- **Functional** meaning: what is a 'GIZ', what does "Integrated" stand for, according to the fact that integration is more often an ongoing process than a state of fact? How to measure an "*Influence* zone". If a European **influence zone** really exists, forming the European region, the notion of influence is quite vague and must be qualified. What are the relevant indicators of what we call influence? Where does the economic influence begin and where does it stop? And what about the financial or political influence? Do these types of influence match in space? Is it possible to make a cartographic representation (based on which indicators) of them? By the way, the concept of functional region is quite relevant and can be used at several scales: EU and its neighbours can be considered as a region, eventually based on several types of flows; but multinational territories such as Mediterranean, Balkans, Black Sea and Baltic region can also be considered as functional region, being composed by countries between which interaction grow rapidly.

- **Cultural** meaning: is a cultural definition of a region efficient to address the role of Europe in a regional and eventually global frame? Is it relevant to give a cultural interpretation of the relations established between EU and the surrounding countries? Isn't it dangerous and wrong to consider Mediterranean as a barrier between two worlds? And is the gap between Christianity and Islam larger than that between Catholicism and Orthodoxy? At last, what about the geographical meaning of culture? Is it possible to determine where a cultural area begins and ends in space?

C.4.3.2 REGIONS' LIMITS:

- '**Margins**', '**periphery**', even '**Neighbourhoods**': the centre-periphery model. The centre periphery model must be addressed in this study. If Euromediterranea is a functional region, essentially based on economic relations, that means that these relations are managed and controlled by centres (the great metropolis of EU for example) which eventually dominate peripheries, that is to say the neighbour countries. But this representation must be qualified. Actually, who could consider Russia as a periphery of EU? Nevertheless, although this model is nothing but a model, it has a power of explanation and can be used at different scales (EU and its

neighbours, gateway cities and their influence area, etc). The notion of **neighbourhood** is also vague. One can hardly say how wide it is. And the width of the European neighbourhood depends on the issue taken into account: the neighbourhood is not limited to the area eligible to the ENP; for example, Central Asia and Iran, although far from EU, may be considered to a certain extent as parts of this neighbourhood (big oil and gas producers).

- **Frontiers** and **borders**: in the case of large Region, are they to be different from classic national borders? It is quite uneasy to say where the borders EU or Europe are. It is even harder when considering not only EU or European continent but the functional region called wider Europe or Euromediterranea? Are they border lines or border zones? How do they function? Is the economic limit of the European space the same as the political limit for example?

C.4.3.3 INTERACTION BETWEEN TERRITORIES:

- "**Triade**"
- Is it a still relevant concept? (is Triad European trade stronger / or weakening? What about Indian, Chinese and Brazilian rise, etc). Are intra-euromediterranean flows (migrations, trade, investment, public aid, etc.) stronger than those between the mains regions of the Triad?
- Is "**Region**" a relevant substitute? Quid about what could be an "Indian" or "Russian" Region?
- Status of **cross border territories**: are they integrated or not? Are they social and economic margins where development is hampered by a border effect? Are the borders of EU interfaces or barriers? What is their impact on the region functionally related to the borders?
- What are the links between local and global level (the concept of "**archipelago**" is vague):
- Precise definition of **gateways** (i.e. *cities*); is a network based conception of Europe and of the world more efficient and relevant than territorial one?
- Are those gateway cities functioning as interfaces between Europe and its neighbour?

C.4.3.4 POLICIES:

"Cooperation"
"Integration"
The emergence of a macro region called Euromediterranea is not only a spontaneous phenomenon. Although, the processes of **integration** inside EU and between EU and its neighbourhood have not reached the same levels, they are both based on political process and institutional tools used at different scales (local, national, transnational), among which **political, economical, cultural cooperation**.
The concept of **integration** must be precisely defined because it involved several fields (economy, politics, etc). Besides, it is not based on the same mechanisms inside EU and in the wider Europe including EU and its neighbour. Regarding the policy proposals, one must ask whether the tools of integration implemented by various institutions are efficient or not for the enhancement of EU – neighbourhood relations.

C.5 CASE STUDIES
Clarisse Didelon

The case studies objective is to deepen the results on specific point that have not been analysed in the framework of key questions. The case studies focus either on thematic, geographical or political concern. A specific case study has to be strongly linked to the project as a hole and more particularly to key questions.

C.5.1 CASES STUDIES REPORT TEMPLATE PROPOSAL

In the final report, extracts and maps & charts of cases studies will be integrated to key questions results presentation. However in order to valorise the participation of the experts to the programme Europe in the World, the integral text of all cases studies will be gathered at the end of the final report in an specific annexe. Is order to harmonize the cases studies, core teams and experts who attended to the project kick off meeting that held in January in Paris, agreed to a template that each expert would have to strictly follow. The proposed template is the following one:

- Justification of the case studies and link to key question (1/2 page).
- Scale of the study. Clear indication of the space of study (1/2 page).
- Context of case question (2 pages)
- Hypothesis (1 page)
- Replicable methodology, problems, questions (2 pages)
- Empirical result of the case study (5 pages)
- Participation to the answer of key question (2 pages)
- Suggestion for future case studies (1 page)

Cases studies should have about 20 pages, including 14 pages of text and about 6 for maps, charts, tables and other illustrations. The first results of case studies will not be presented in this first interim report. They will be presented in the July meeting of the teams of Europe in the World project in Paris and will be added to the next interim report (December 2005).

C.5.2 CASE STUDIES COORDINATION

As we underline the strong link between case studies and key questions, it seems very relevant that case studies could be group and manage by a responsible core team. Composition of groups has been decided during the kick-off meeting between core teams and experts. Case studies are grouped as follow:

- WP 8.1 Labour shortage, outsourcing and replacement migration & WP 8.2 The impact of relocation on the position of European regions in value chain & WP 8.8 Focus on geographic patterns and flows of knowledge in Europe & Internationalisation of Italian enterprises. Responsible team : **ITPS & IGEAT**

- WP 8.3 Focus on selected European gateway cities, WP 8.4 Exploration of gateway and GIZs in other continents & WP 8.11 Internationalisation of Italian enterprises. Responsible team : **HWU**
- WP 8.5 The Estonia-Russia border : barrier or contact and cooperation zone, WP 8.7 The new eastern and southern external border of the EU, WP 8.9 Focus on Romania as Easter border of EU, WP 8.10 Focus on Switzerland (+ WP 8.12 ? : morocco ?). Responsible team: **LADYSS.**
- WP 8.6: Survey on the "Weltanschauung" of the ESPON community. Responsible team : **Géographie-Cités**

C.5.3 WHAT KEY QUESTIONS ARE WAITING FROM CASES STUDIES?

The following table summarises the link between the cases studies and the key questions:

Table 12 : Link between case studies and key quesions

	Division of the World	European networks	European neighbourhood	Internal differentiation
WP 8.1 Labour shortage, outsourcing and replacement migration	?	X		X
WP 8.2 The impact of relocalisation on the position of European regions in value chain		X		X
WP 8.3 Focus on selected European gateway citie	?	X		
WP 8.4 Exploration of gateway and GIZs in other continents		X		
WP 8.5 The Estonia-Russia border : barrier or contact and cooperation zone			X	?
WP 8.6: Survey on the "Weltanschauung" of the ESPON community	X		X	
WP 8.7 The new eastern and southern external border of the EU			X	?
WP 8.8 Focus on geographic patterns and flows of knowledge in Europe		X		X
WP 8.9 Focus on Romania as Easter border of EU			X	?
WP 8.10 Focus on Switzerland			X	?
WP 8.11 Internationalisation of Italian enterprises			X	
WP 8.12 Morocco (?)		X	X	

The following parts presents to which aspects key questions and cases studies are linked and what the key questions are excepting from case studies. Those presentations can be of to kinds from a simple list of questions to each case study to the description of the main objectives in a specific group of case studies in order to start the work of coordination of cases studies.

C.5.3.1 QUESTIONS FROM THE KEY QUESTIONS "DELIMITATION OF WORLD REGIONS"

The key question "delimitation of World Regions" is particularly waiting for the results of cases studies on the European borders regions (see 3.3). It expects to get answers on the delimitation of Europe influence area in order to help the team to draw the limit of this particular region of the world.

This key question is much more bounded to the case study WP8.6: Survey on the Weltanschauung of the ESPON community. That case study will come as a complement to the work undertaken in the key question framework i.e. work on databases on official and operational divisions proposed by international organisation and private companies. The case study is based on a survey that will be realised on the members of the ESPON community in the Luxembourg ESPON meeting in May. It aims to provide a picture of the perception of the position of Europe in the World inside this specific community and to analyse the answer according to personal characters as age, nationality and their usual mobility in other European and World countries. The survey is now on a test phase as the questionnaire have been proposed twice in the ESPON framework (Europe in the World kick off meeting in January 2005 and Lead Partners Meeting in February) and twice in Paris 7 university framework.
The aim of this survey is to confront its resulting division of the World and European Union border with those obtained by the analyse of the firms and international organisations ones and with the divisions provides by a as much as possible unbiased statistical analysis.

The results of the preliminary surveys will not be presented in this First Interim Report to avoid biasing the answer of the survey that will be held in May.

C.5.3.2 QUESTIONS FROM THE KEY QUESTIONS "EUROPE IN ITS NETWORKS"

This key question is linked in particular to the case study on a selected set of European Gateway cities (WP8.3). Taking support on our former work in ESPON 1.1.1., three cities are proposed to better understand how their own characteristics (such as concentration of headquarters, university, administration, cultural and tourist opportunities…) could have an impact on the way flows are distributed among the whole network. The three cities are:
· **Paris**: as the second giant airport in Europe with a wide range of connections all over the world and in particular with important connections with the countries from the Southern part of the Mediterranean Sea.
· **Madrid**: with a very high share of extra-European passengers (similar to Paris and Amsterdam for example) and a more mono-oriented flows towards mainly South America.
· **Stockholm and/or Copenhagen**: as dominant cities at the meso-regional level consolidating their role of Northern gateway of Europe attracting flows from Baltic countries.

As cities are the points at which the internationalization processes of a territory begin and materialize, this case study will give relevant indications on the way a Gateway emerges and on the way a polycentric development could be consolidated.

This key question will also benefit from relevant inputs from the case study on the internationalization of Italian enterprises (WP8.11). Analyzing networks and flows originated by Italian enterprises involving Eastern European countries (both inside and outside EU 25) and Southern Mediterranean ones (i.e. Tunisia, Algeria, Morocco), such case studies will give

both quantitative and qualitative complement to the way Italian gateways cities help connecting Italian space to the rest of the world and in particular to other European countries and regions and to the neighbour countries outside EU.

C.5.3.3 QUESTIONS FROM THE KEY QUESTIONS « EUROPE IN ITS NEIGHBOURHOOD"

In a text recently published, the commissioner for external relations, Madame Ferrero Waldner, says that the external borders on the EU shall not be turned into barriers between the member countries and the neighbourhood. The neighbour countries must take benefit from their geographical proximity to EU and must benefit from certain aspects of the European integration, especially those regarding the economic field. In the same time, European commission often underlines the fact that EU must be able to have an influence on its neighbourhood in order to maintain regional stability and peace and to stimulate economic and social development. As a consequence, and in line with the ideas developed by the European commission since 2003, borders and border regions are of particular importance in the frame of the project ESPON 3.4.1., dedicated to the relations and interactions between Europe and surrounding countries.

The case studies related to the key question neighbourhood shall not have only a monographic value. Borders and border region of EU must not be studied for themselves and in themselves without any connection with the rest of the project 3.4.1. They must be considered as examples of larger processes and issues that have to do with the process of integration inside a large macro region that we can call a "wider Europe":

- What do they learn us about the relations between EU and its neighbourhood in general, since the beginning of 1990s?
- What do they tell us about the functioning of the external borders of EU?
- What is their role and impact on the economic and social development of external and internal border regions of EU?

In each case study, several scales of analyse shall be taken into account: local, regional and international. Sometimes a barrier effect can happen to be higher at the local level than at the regional or international level. That is why we could use the achievements of previous ESPON projects as a starting point for our own reflections:

- The chapter 4 of the third interim report of ESPON project 1.1.4, almost totally dedicated to the typologies of new external borders of EU after the last enlargement.
- The chapters dedicated to the impact of enlargement on peripheral and border regions of EU in the project ESPON 2.2.2.

C.5.3.3.1 What are the questions about the external borders and border regions of EU?

- How do they function: are they barriers or hinges (eventually interfaces) between EU and its neighbours and between internal and external border regions?
- What is their impact on the organization of space in the internal and external border regions? Is a border situation an advantage or a disadvantage to enhance the local economic and social development of regions located on both sides?
- What is their impact at a larger scale, on the relations between states, between EU and its neighbours?
- At what scale is the process of integration is the more efficient and obvious : at the local level, involving internal and external border regions (with a special focus on the local cross border cooperation and on the local cross border non institutional cooperation, traffics and exchanges of all natures)? At the regional level, involving large multinational (trans national) territories unfolding one both sides of the EU border line (what is the role of Rumania for example in the process of regional integration encompassing the Balkans and the countries around the Black Sea)? At the international level (do the neighbouring countries link themselves to Europe by developing ties and connexions directly with the centre of EU or by developing their relations with the peripheral regions of countries of EU located next to their own territory)?

C.5.3.3.2 Proposal of objectives for case studies

The following objectives are proposed to all partners and experts who work on neighbourhood matters:

- To study the recent evolution, from 1990 up to now, of cross border and international exchanges across frontiers chosen in Eastern and Southern Europe. We may be able to identify different evolutions of relations according to the scale taken into account. Over the same period, the evolution of different kind of flows will be analysed: goods, investments, persons, services, etc…

- To explain which factors determine the level of cross border relations? The following questions will have to be answered in the framework of each case study:
- What is the legal framework of the exchanges between countries and regions on both sides of the borders? Are the political relations between states located along those borders good or bad? What are the level and quality of their official cooperation in different fields? The process of cross border cooperation at the local level will be analysed in the frame of programs such as Interreg III A, Tacis CBC, Phare CBC, Meda, etc. What are the cooperation programs underway? Is it a success or not and why? Does this program enhance the quality of cross border relations? Do they have an impact on the local development? Last, Is there any correlation between the level openness of borders and the level of economic development of the regions concerned?
- What are the actual conditions of these exchanges (how many check points, qualities and number of cross border infrastructures and facilities)?
- What are the internal political debates about the common border in each state? What is the state of public opinion about these borders and what are the main social representations about them? Are they the same on both sides or not?

- Are there national minorities in the border region? Is it a factor of increase of the cross border relations and eventually cooperation or not?

C.5.3.3.3 Which borders and border regions do we choose?

In the frame of a comparative analyse, the goal of the case studies is (i) to underline what is equivalent and what is different in the functioning of the former, actual and future external borders of EU, (ii) to analyse their role in the process of integration between Europe and its neighbourhood and the role of all the actors involved in that process at the international, national and local levels.

- The border between **Ukraine, Romania and Moldova** is particularly relevant to these goals, as the future external border of EU (WP8.9: Focus on Romania as Eastern and Southern external border of the EU). It will be studied by the Romanian expert team (TIGRIS). They will study the functioning of the borders between these three countries which do not belong to EU yet. They will also put the stress on the role of Rumania as an integration factor in the South-Eastern region of Europe located on the fringes of EU and ESPON space, between Turkey and former USSR.

- The border between **Hungary and Serbia**, and secondarily between **Hungary and Rumania**, will be studied by the Hungarian expert team (CRS-HAS) in a comparative way (WP 8.7: The new Eastern and Southern external border of the EU). These border regions are quite different: the levels of development and the quality of politic and economic relations are not the same. Besides, the membership of the Yugoslavian Federation in EU is still far remote, whereas the enlargement of EU to Rumania is planned to happen in 2007 or 2008.

- The border between **Russia and Estonia** will be studied by a French team (LADYSS), as an example of extremely closed barrier between EU and its neighbourhood (WP 8.5: Focus on selected ENP countries). Is it right at all the levels? If there is time left, LADYSS may study the Eastern frontiers of Latvia which concerns to former soviet republics (Russia and Belarus). According to the recent evolutions, it seems that the cross border cooperation is still underdeveloped between **Baltic States, Russia and Belarus**. It also seems that, maybe because of the bad quality of local and international relations, the border regions of Estonia and Latvia are suffering from very low levels of development. At last, Estonia and Latvia are particularly relevant examples of what happens in the process of regional integration because they are involved in several programs of cooperation at the local (cross border cooperation) and regional level (Trans national cooperation).

- Following the ESPON project 3.4.1. answer to the tender, the **southern border of European Union**, i.e. the border materialized by the Mediterranean Sea was not excepted to be studied. However it seems that it would be very useful to add to the already excepted case studies on the European frontier one focusing on the North African countries. This case study that still has to be precisely defined will be undertaken by a Moroccan expert team under the responsibility of the LADYSS core team.

C.5.3.4 QUESTIONS FROM THE KEY QUESTIONS "INTERNAL DIFFERENTIATION OF EUROPEAN TERRITORY".

C.5.3.4.1 Presentation of the linked case study: The impact of relocation on the position of European regions in value chains (WP 8.2; IGEAT)

Through their economic structure, regions position themselves within (often international) value chains. The Global Value Chain Initiative (http://www.ids.ac.uk/globalvaluechains/) defines value chains as the « full range of activities that are required to bring a product from its conception to its end use and beyond. This includes activities such as design, production, marketing, distribution and support to the final consumer. The activities that comprise a value chain can be contained within a single firm or divided among different firms. » (see also Kaplinsky (2000)).

In this respect, the most representative sector is the textile value chain, with its multiple segments showing a variety of technological and added value characteristics. The textile sector is also interesting because it is vulnerable to the relocations (at the beginning of the period, it was a sector with added low value). The textile sector is located in relatively well defined areas (what could reinforce an effect of crisis) among which we will study the "Courtraisis" area, Tuscany and Emilia Romagna (the third Italy), northern Portugal and Jutland.

Processes of relocation of production, for example through competition by low-cost labour areas, are, generally, relocations of one part of a global value chain. Those areas which have been « victim » of such relocation face several possible paths:

1) an economic decline because no replacement activities can be initiated
2) the rise of other economic activities that are part of other value chains
3) the shift of the regional activities along the value chain, generally to more knowledge and/or more capital intensive segments

The third element leads to a situation in which the "victim" area does not lose its part of the value it captured through the old activities. The study will be based on a bibliography, outlined hereafter, that will allow us to draw up an inventory of textile areas in Europe.

- Essays on Regional Development in Europe. Report 101, Dept. of Geography, Roskilde University 1994
- BENKO G, LIPIETZ A. (2000), La richesse des régions ; La nouvelle géographie socioéconomique Collection Économie en liberté, Presses universitaires de France.
- BENKO G., LIPIETZ A. (1992) Les Régions qui gagnent : districts et réseaux : les nouveaux paradigmes de la géographie économique, Presses universitaires de France.
-VANDERMOTTEN Ch., MARISSAL P. (2003) la production des espaces économiques, Editions de l'université de Bruxelles, tomes 1 et 2
- Revue de Géographie de Lyon, volume 70, n°2 (1995) les nouvelles mailles du pouvoir local.
- Coll. (1998), Wallonie et Bruxelles : évolutions et perspectives planification, aménagement du territoire et relations transfrontalières centre interuniversitaire de formation permanente treizième congrès des économistes belges de langue française nov 1998

- BAGNASCO A., SABEL C.F. (1994), PME et développement économique en Europe, Paris la Découverte
-BIANCHI G. (1998), Requiem fot the third Italy ? Rise and Fall of a too successful concept, Entrepreneurship 1 regional development, 1
-ILLERIS S. (2000). Adapting to Foreign Competition: The Textile and Clothing Industry in the Herning-Ikast Area of Jutland, Denmark. I Small Town and Rural Economic Development: A Case Studies Approach, eds. P.V.Schaeffer & S.Loveridge. Westport, Conn: Praeger.
- ILLERIS S. (2000). Outsourcing of Textile and Clothing Industry from Denmark to Baltic Transition Countries. I Global-Local Interplay in the Baltic Sea Region, eds. J.W.Owsinski & M.Johansson. Warsaw: The Interface Institute.

Textile industry in OECD countries, Paris, Organisation for Economic Co-operation and Development
Industrie textile: étude statistique
Etat de collection (1962)-(1982)

This case study will be completed by a statistical analysis of the more specifically studied areas (Courtraisis, Tuscany and Emilia Romagne (the third Italy), northern Portugal and Jutland). These data will allow us to sharpen and corroborate – or not – the different analyses.

Proposed methodology

1. Analysis of the initial structure of the areas studied.

2. On the basis of the initial area structure, we will carry out a socio-economic assessment of the area from the 1960s to date:
 − in terms of the area's results
 − in terms of the results of the rest of the national economy
 − in terms of the results of the rest of Europe's economy
A table will present the different socio-economic indicators selected for each area

3. From this assessment, we will try to highlight the solutions found to counter the possible external obstacles the area is faced with (for example, the weight of external competition and its socio-economic consequences). These solutions can be found in moving up the value chain or repositioning a key sector of the area.

4. Internal restraints have to be analyzed as well:
 − deficiency in R&D
 − insufficient financing capacity of small employers
 − lack of skilled workforce
 − insufficient or inadequate training
 − …

5. With the help of an analysis of the fine import and export structures of the areas, we will try to determine if some of them benefit from delocalization. We will pay particular attention to some segments such as textile machinery, fibres, etc. If, for example, a rise in textile machines exports – with or without an increase in imports of low added value products (such as clothes, fabrics…) – should be noted, we could put advance the hypothesis that some areas could take advantage of relocations through

exporting machines towards the destination areas of the delocalization process. In case we observe such a rise, we will, through case studies, analyze whether this rise of exportations profits the "victim" areas that have shifted their production along the value chain or whether other regions (independent of the relocated segments) have captured these markets.

Some mechanisms subtending the regional trends mentioned in the part "E.4: Internal differentiation of European territory" will be better understood using the conclusions of some more in-depth case studies. If we consider the proposed WP 8 case studies, the following first set of questions could be asked (but perhaps it could be better to redefine the title and the content of some case studies):

C.5.3.4.2 Questions to other cases studies

WP 8.1: Labour shortage, outsourcing, replacement migrations:
- Which countries could provide Europe with the quantitatively and qualitatively required manpower, and which countries / regions are most likely to receive this immigration?
- What are the specific responses of the different economic sectors to a mix of labour shortage, high wages and low transportation costs?

WP 8.3: Focus on selected European gateway cities:
- What are the geographical specificities (destinations, activities, etc) of the main European gateways and level 01 metropolitan regions?

WP 8.4: Exploration of gateways and GIZs in other continents:
- What are specificities of the gateways and main metropolitan regions in the world in relation to Europe and to which European countries/regions are they linked in particular?

WP 8.7: The new Eastern and Southern external border of the EU:
- What are the gaps between external bordering countries and Europe, by comparison to the « Rio Grande » border in North America and what impact does this have on the European border regions?
- What could be the consequences of the tourist industry development of those countries on the European Mediterranean countries tourist sector?

WP 8.8: Focus on geographic patterns and flows of knowledge in Europe:
– Is there a link between the location of the production of knowledge in Europe and the economic results? How is this location influenced by globalisation?
– Do the English-speaking regions have a comparative advantage concerning R-D and the impacts of the flows of knowledge?
– What could the consequences of the relocation be of advanced IT services? Will those relocations concern only execution processes or also design processes?

WP 8.9: Focus on Romania as Eastern border of EU:
- Is Romania able to compete for labour intensive industries with extra-European countries, like China or South-eastern Asia (and possibly Turkey in the future if both become member or associated to the EU?
- Can we have an idea of the importance and the impact on the Romanian economy of short time or temporary working migrations to the Western part of Europe?

WP 8.10: Focus on Switzerland:

- Is Switzerland able to be at the same time a manufacturing, banking and tourist country, while staying outside the EU and the Eurozone?

WP 8.11: Focus on Internationalization of Italian enterprises:

- Are the textile-clothing industrial districts like Tuscany or Umbria able to compete with low cost intra- or extra-European countries?
- Do the firms of such districts want to relocate and are they able to go up the technological chains or to specialize in the business or design segments?
- Is the development of the Puglia industrial district linked to the global competition affecting North-central or Northern manufacturing districts, possibly using low-cost manpower (for instance Albanian)?
- How are the Italian enterprises managing the low R-D level in Italy, in a context of globalization?

D PRELIMINARY RESULTS ON STRUCTURE AND FLOWS

D.1 STRUCTURAL EVOLUTION OF POPULATION AND GDP PPPs OF WORLD STATES (1952-1998)

Claude Grasland, Clarisse Didelon & Nicolas Lambert (UMS RIATE)

D.1.1 INTRODUCTION

The aim of this preliminary study on demographic and economic evolutions at the world scale is not to provide final results on thematic topics which will be analysed in depth by specialised research teams (IGEAT for Economy and ITPS for Demography) during the development of the project ESPON 3.4.1 with much more detailed indicators and interpretation. It is rather to explore basic exploratory tools related to cartography and statistical analysis and to propose a validation of the methodology which will be applied in the future.

To provide such an experiment, we have decided to focus on a long term database realised by Angus Maddisson on the economic and demographic situation of World States from 1950 to 2000, available on his personal website and published in 2003 by OECD. This database has been completed by estimation for some missing values but initial information established by A. Maddisson has been fully respected when available.

The most important modification introduced in our analysis was the application of a five-year smoothing on all figures of population in order to reduce the influence of exceptional fluctuations and to focus the analysis on main trends of evolution during the whole period. Due to this five-year smoothing, the time span is reduced from 1950-2000 to 1952-1998 because 1952 represents in fact the mean value of 1950-54 and 1998 the mean value of 1996-2000.

Another important modification of the initial information was the transformation of each absolute count of population or GDP into a frequency of the world sum. For example the population of France in 1998 (60 Millions of inhabitant) is divided by the population of the World (6 Billions) in order to obtain a frequency of world population (1%) which can be easily compared to the frequency of GDP of France at the same time or the frequency of population of France from another year.

It is finally important to keep in mind that the table of GDP proposed by Maddisson is expressed in PPPs which has an important influence on all results which would have been strongly different if we had chosen to measure the economic size of world States in current US $. Concerning population, the figures proposed by Maddisson are very similar to those proposed by other international sources (UN, CIA) and using another type of source would not modify the results except in some very specific cases.

Last, we decide not to take into account in our analysis States of whose population, GDP or surface represent less than 1 millionth of the world. Those very small states could have introduced bias in our results as they often have very specific evolution of GDP or population.

D.1.2 DEMOGRAPHIC EVOLUTION OF WORLD STATES 1952-1998

D.1.2.1 THE EVOLUTION OF THE DEMOGRAPHIC SIZES OF EUROPEAN STATES AT THE WORLD LEVEL

The distribution of demographic size of States during the whole period is characterised by a strong concentration in a very limited number of States. The European territory is characterised by the lack of very large States and the great heterogeneity of demographic size, from very small to medium or large (Map 3 and Map 4)

Very large States (G>1: more than 10% of world population)
From 1950 to 2000, China and India are the only States which can be considered as "very large" (G<1: more than 10% of world share) and they always represent together at least the third of the World population.

Large States (1<G<2: between 1% and 10% of world population)
In the 1950's, the ESPON area accounted for 5 States which could be considered as "large" from a demographic point of view at the world scale: Germany[13], U.K., Italy, France and Spain. But actually, only France and Germany remain in this category and still represent more than 1% of the world population, and probably not for a long time in the case of France. In the particular case of Eastern Europe, the former USSR which could be considered as a "large State" in the 1950's has been replaced by new States among which two can be considered as "large" actually (Russia and Ukraine). In the rest of the World – and considering actual political boundaries - some States remain demographically "large" on the whole period (USA, Mexico, Brazil, Japan, Indonesia, Nigeria, Pakistan, Bangladesh and Vietnam) and some others are moving from "medium" to large. This last category is particularly interesting because it concerns at least 3 States located in the neighbourhood of Europe: Turkey, Egypt and Iran.

Medium States (2<G<3: between 0.1% and 1% of world population)
The third level of demographic size defines the medium situation which is characteristic of the majority of the ESPON States in the 1950's as in 2000. But with a double movement of former "large States" becoming "medium" (UK, Italy, Spain) and former "medium States" becoming "small" at the world level (Denmark, Norway, Finland, Austria…).

Small States (G>3: less than 0.1% of world population)
As described above, an increasing number of ESPON states are becoming member of the category of "small" or "very small" States at world level, from a demographic point of view. The political division of former federations (Yugoslavia, USSR, Czechoslovakia) has enhanced this trend which was basically related to slower demographic growth in Europe than in the rest of the World.

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[13] Even if we take into account the geopolitical division of this period, western Germany represented more than 1% of world population in 1952 and could be considered as « large ».

Map 3 : Share of the world population in 1952

SHARE of the WORLD POPULATION in 1952 (5 years smoothing)
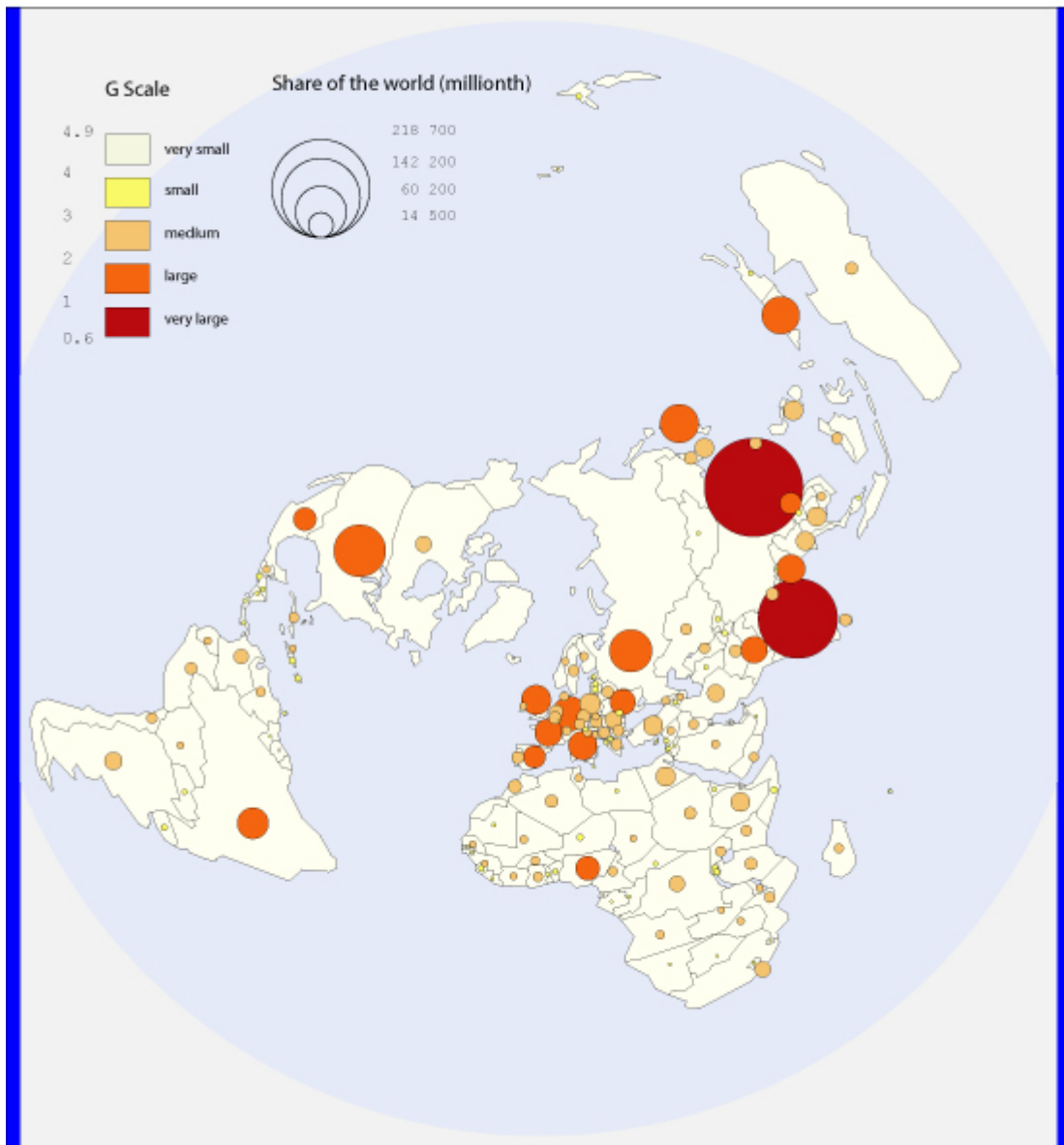
G Scale

4.9
4
3
2
1
0.6

very small
small
medium
large
very large

Share of the world (millionth)

218 700
142 200
60 200
14 500

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Clarisse DIDELON, Claude GRASLAND, Nicolas LAMBERT, Christine ZANIN
Origin of data : Angus Maddison Website (2005) - http://www.ggdc.net/~maddison/

Map 4 : Share of the world population in 1998

SHARE of the WORLD POPULATION in 1998 (5 years smoothing)
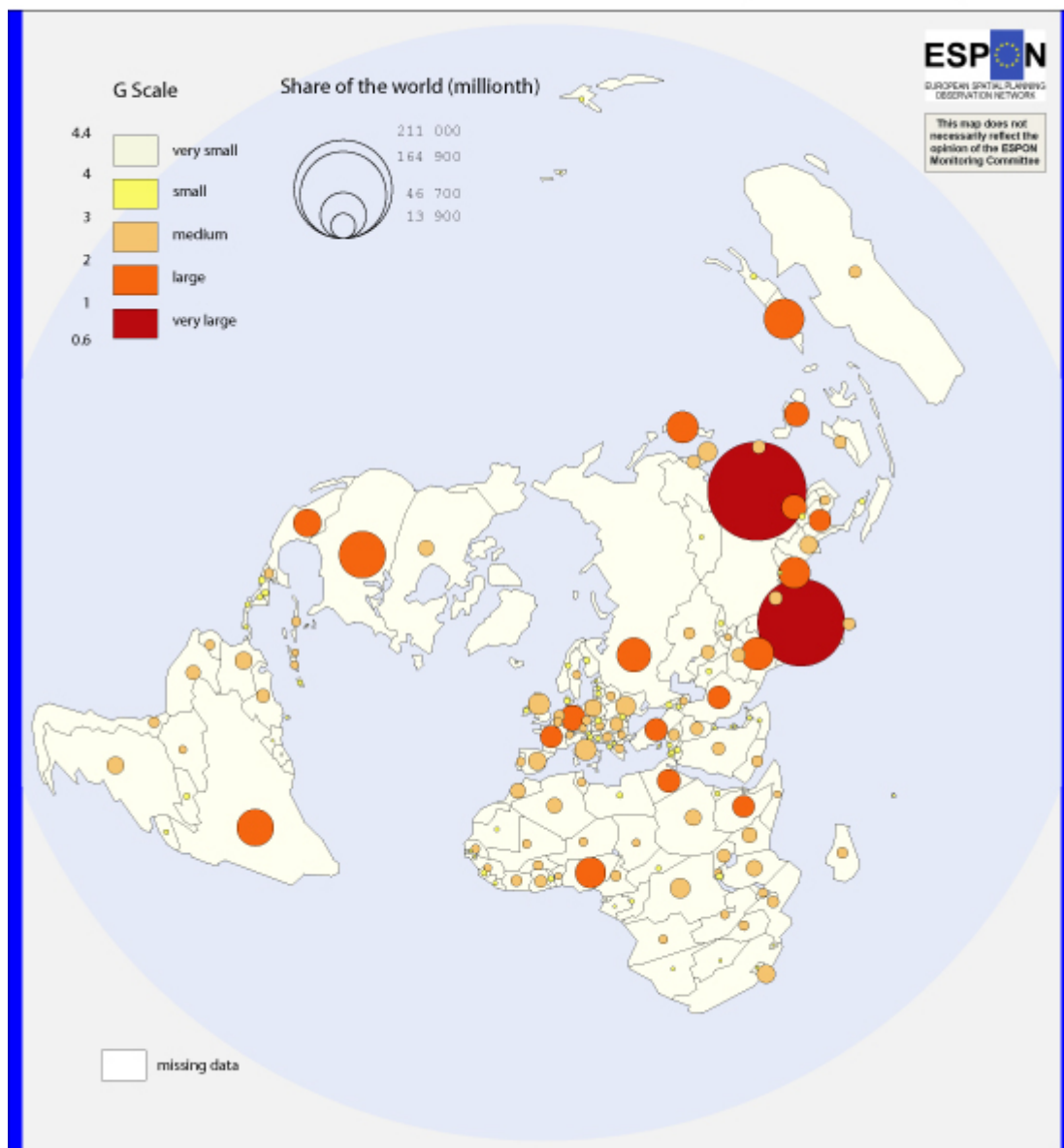
D.1.2.2 THE EVOLUTION OF THE EUROPEAN POPULATION IN ABSOLUTE AND RELATIVE TERMS

Evolution of world population in absolute terms

The annual average growth rate of population of ESPON States over the period 1950-2000 is clearly among the lowest at the world scale but we do not observe any case of negative evolution of population (Map 5). The lowest rates of population increase at the world scale (less than 0.4% /year) are observed in central Europe (Austria, Czech republic, Hungary, Bulgaria, Portugal) but the majority of ESPON States are rather characterised by a small increase of population growth (between 0.4% and 1.2% / year), which is comparable to the situation observed in Japan and former republics of Soviet Union (except central Asia). ESPON area is a part of a continuous area of low population increase (the "yellow banana"?) which covers all States located between Tokyo and Lisbon. Out of this central area of demographic weakness, we can identify a group of States with medium evolution of population at the world level (between 1.2 and 2.1% / year) which combines non-European industrialised States (USA, Canada, Australia, New Zealand, Chile, Argentina, Southern Korea, …) and the biggest countries of the Third World (China, India, Indonesia) which have developed policies of birth control. The highest levels of population growth concern the rest of the World and associate both emerging and underdeveloped countries which have experimented with some difference in timetable the demographic transition during the period 1950-2000.

Evolution of world population in relative terms

The evolution of the share of world population represented by each State in 1952 and 1998 provide a very different picture of the demographic recombination of the World during the last 50 years (Map 6). Indeed, States which have increase their population in absolute terms but with a rate of increase lower than the world trend will necessarily experiment a reduction of their share at the world scale. For example, the share of France in world population has declined from 1.66% of world population in 1952 to 1.02% in 1998, which means a reduction of –0.64 pts, in terms of world demographic share (blue circle). In the same time, Turkey moved from 0.85% to 1.08% of the world population, which represents an increase of +0.23 pts in terms of world demographic share (red circle).

Looking at the Map 6 it is very clear that all States located in the ESPON territory are characterised by a dramatic reduction of their share of world population, but we can notice that it is also the case of Japan, Russia and China which are all characterised by a strong reduction of their share of world population during the period 1952-1998. The most important gains of world population share are firstly observed in India (where birth control was not as much strictly applied as in China) and more generally all States of southern Asia, Africa and Latin America (except for the southern part).

This translation of the world gravity centre of population from north to south is a major feature with very important political and economical implications for Europe, especially if (as we will see in the next section) it is not followed by an equivalent translation of world economy.

Map 5 : Annual average growth rate of population 1952-1998

ANNUAL AVERAGE GROWTH YEAR of POPULATION between 1952 - 1998
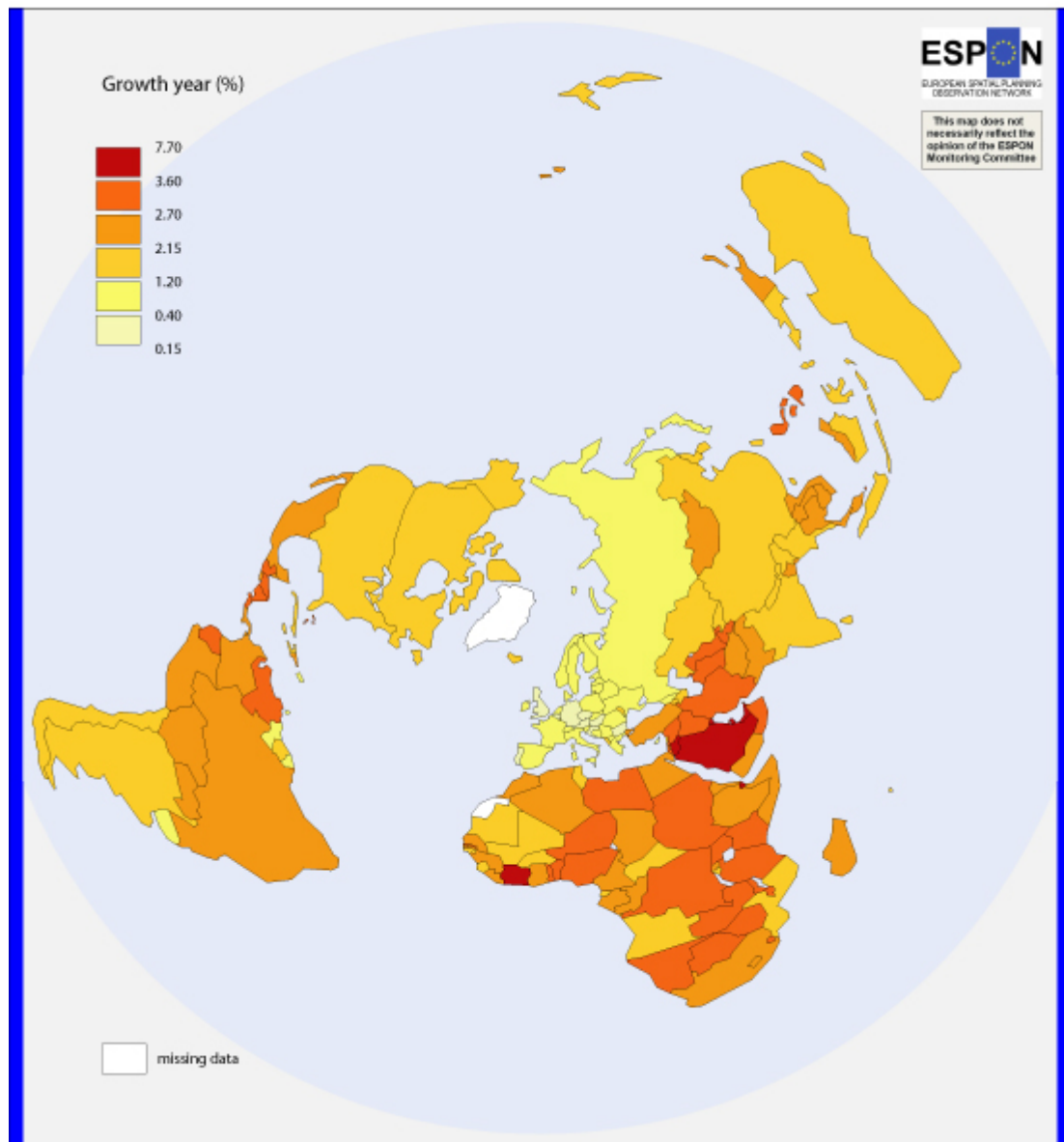
Map 6 : Difference between share of world population in 1952 and 1998

DIFFERENCE between SHARE of the WORLD POPULATION in 1998 and 1952
(five year smoothing)
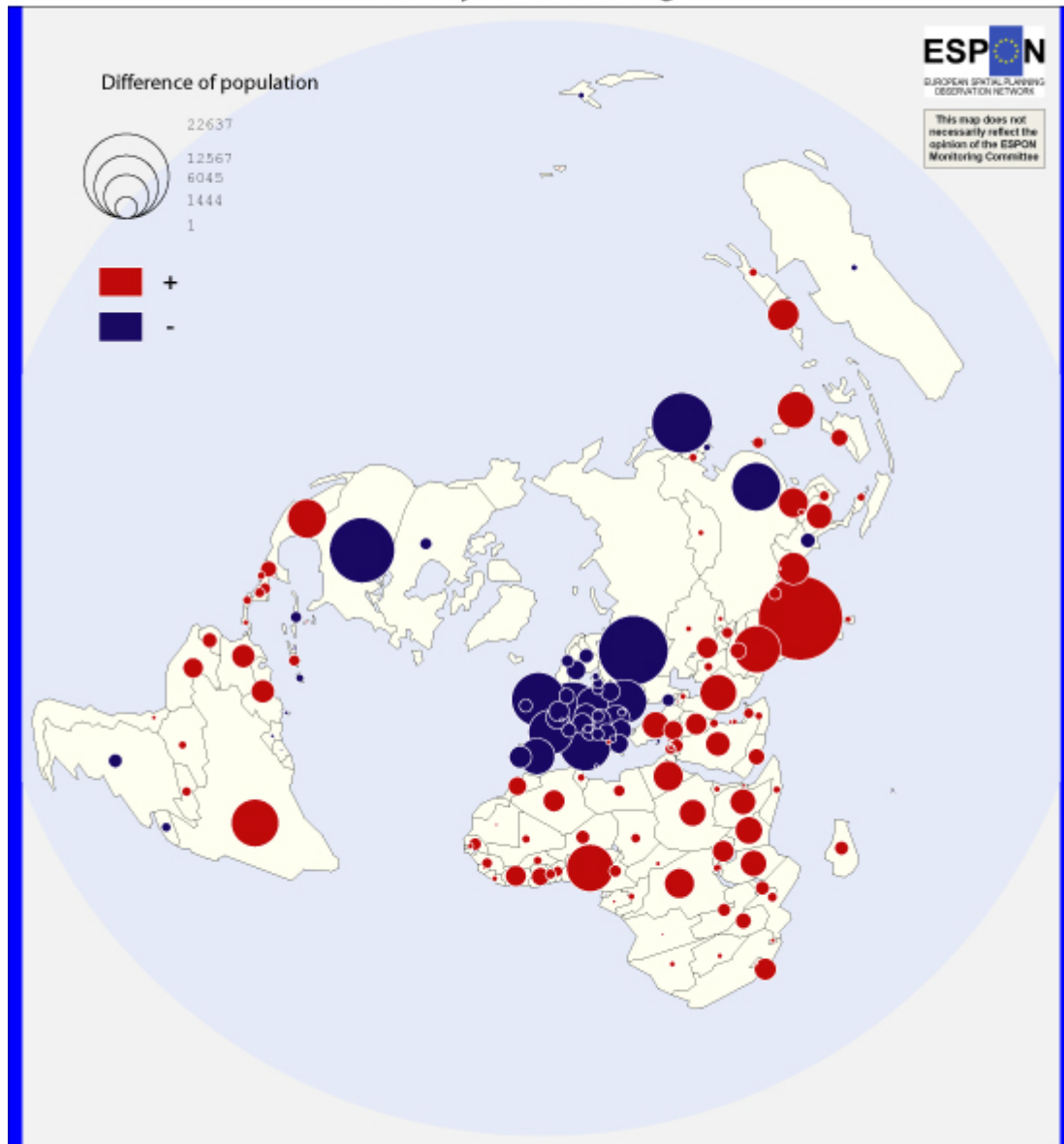
D.1.2.3 TYPOLOGY OF DEMOGRAPHIC EVOLUTION OF WORLD STATES (1952-1998)

The aim of the synthetic typology presented in Map 7 is to take into account the specificity of the demographic evolution of each State with a cluster analysis which takes into account all years of the period and not only the situation at the beginning and the end[14].

Type A: Regular increase

States from type A are characterised by a regular increase of their demographic weight in the World during the period 1950-2000. This situation is mainly determined by the fact that States of this category are at the core of their demographic transition, at the moment when mortality has strongly declined but fertility remains temporary at a high level, causing a very strong natural increase. In certain cases, this natural increase is reinforced by migratory attractiveness, producing cumulative effects as in the case of States with oil resources (Persian Gulf, Venezuela, Libya …). In the detail, it is possible to distinguish subtypes with exceptional increase (*A.1*), important increase (*A.2*) and medium increase with reduction of growth rate in the 1980's (*A.3*).

Type B: Global stability

States from type B are characterised by a rate of population increase which is more or less equal to the world trend of the period 1950-2000, even if their demographic curve can be slightly different (with periods of lower or higher increase than the World). This situation is typical of new industrialised countries (Australia, Canada, Argentina, Southern Korea) which can balance their relative low level of natural increase by strong level of immigration. It can also be observed in the biggest countries of Third World which have developed a policy of birth control (India, China, Indonesia). And finally in some countries where a high level of natural increase is balanced by strong flows of out-migration toward other countries and peaks of mortality due to political or economic crisis (Angola, Ethiopia, Chad, Afghanistan, Argentina). In the detail, it is possible to distinguish a subtype *B.1* more dynamic than subtype *B.2*.

Type C: Regular decrease

States from type C are characterised by the regular decline of their share in the world population, mainly due to their situation of post demographic transition (low fertility and low mortality) with ageing population and low proportion of young adults. According to this structural demographic situation, States from this category are not able to reach important rates of population, even if they are subjects to flows of in-migration. In the case of United States (type C.1), the demographic decline is relatively limited because the ageing of population is balanced by important and regular flows of young in-migrants. But in the case of European countries, Russia and Japan, the mean age of population is higher and the in-migration flows are able to balance the structural evolution. In this group, one can distinguish between countries with medium decrease of their share of world population (C.2) like France, Russia and Japan and countries with more important decrease. This last subtype (C.3) is characteristic from northern and central part of Europe (Sweden, Finland, Germany, Italy, Hungary, Austria, Czech Republic, Bulgaria) and also from UK and Portugal.

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[14] The methodology used for this cluster analysis is euclidean distance weighted by population of states after transformation values of population in index 100=1952

Map 7 : Typology of demographic evolutions 1952-1998

EVOLUTION of the SHARE of the WORLD POPULATION 1950-54 to 1996-2000
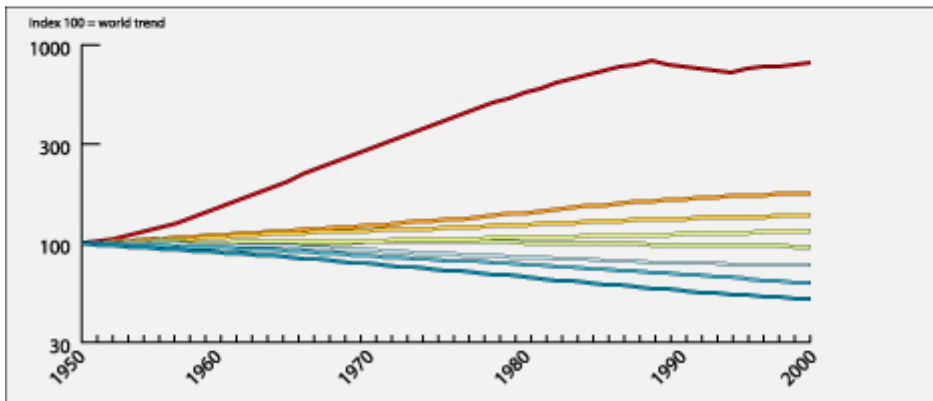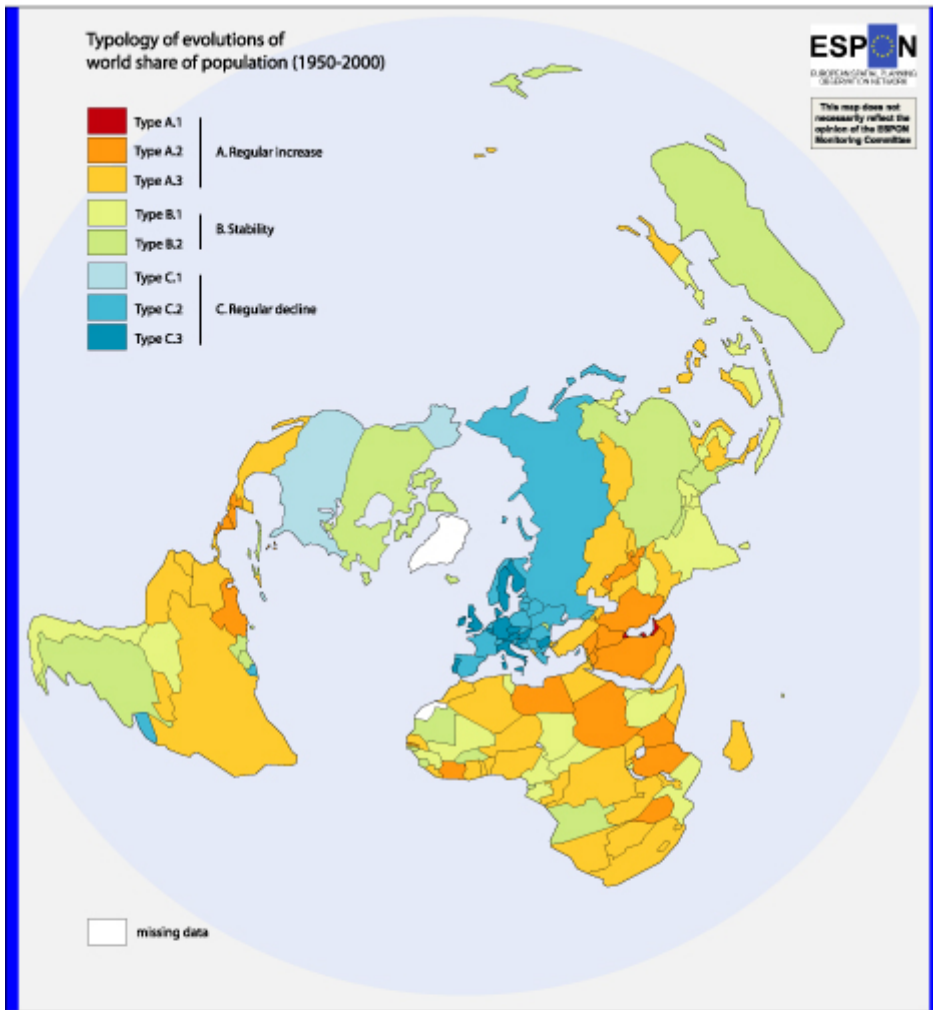
Typology of evolutions of world share of population (1950-2000)

ESPON

Type A.1
Type A.2
Type A.3
A. Regular increase

Type B.1
Type B.2
B. Stability

Type C.1
Type C.2
Type C.3
C. Regular decline

missing data

Index 100 = world trend

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D.1.3 ECONOMIC EVOLUTION OF WORLD STATES 1952-1998

D.1.3.1 THE EVOLUTION OF THE ECONOMIC SIZES OF EUROPEAN STATES AT WORLD LEVEL

The distribution of the economic size of States during the period 1952-1998 appears more stable than the evolution of demographic size, even if some important changes can be pointed (Map 8 and Map 9)

Very large States (G<1: more than 10% of world GDP ppps)
The only State which remains "very large" during the whole period is United States of America which represents 27% (G=0.6) of world GDP in 1952 and 22% (G=0.7) in 1998. China which represented only 5% (G=1.3) of world GDP in 1952 has started to increase very quickly its share of world GDP after 1975 and can be considered actually as very large with 12% of world GDP (G=0.9).

Large States (1<G<2: between 1% and 10% of world GDP ppps)
In the 1950's, the ESPON area accounted for 7 States which could be considered as "large" from economic point of view at world scale: Germany[15], U.K., Italy, France, Spain, Netherlands and Poland. Despite a general reduction of their share of world economy, (except in the case of Spain), most of these States can always be considered as "large" at the world scale but Poland and Netherlands (around 1980) have decreased under the level of 1% of world GDP and have moved to the category of "medium" economic size. In Eastern Europe, the former Soviet Republics of Russia and Ukraine could be considered as economically "large" in the 1950's but it remains true only for Russia. In the rest of the World, the list of economically "large States" has remained very stable (Japan, India, Indonesia, Australia, Mexico, Canada, Brazil), the only exceptions being Argentina (which left the group of "large" States at the beginning of the 1980's), Turkey and Thailand (which joined the group of "large" States at the end of the 1980's).

Medium States (2<G<3: between 0.1% and 1% of world GDP ppps)
The members of the European Union and the candidate or associated countries of the ESPON program are generally classified in the category of "medium" economic size at the world scale during the whole period 1952-1998. We do not observe the move towards the category of "small" States that was noticed for the demographic criteria.

Small States (G>3: less than 0.1% of world GDP ppps)
In 1998, 7 States from the ESPON area belongs to the category of "small" economic size (Estonia, Latvia, Lithuania, Cyprus, Malta, Luxembourg, Slovenia) which is more or less the symmetric of the number of "large" States. The great diversity of economic and demographic sizes of neighbouring States is a major characteristic of the European territory which can not be observed at such degree in other parts of the World.

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[15] Even if we take into account the geopolitical division of this period, western Germany represented more than 1% of world population in 1952 and could be considered as « large ».
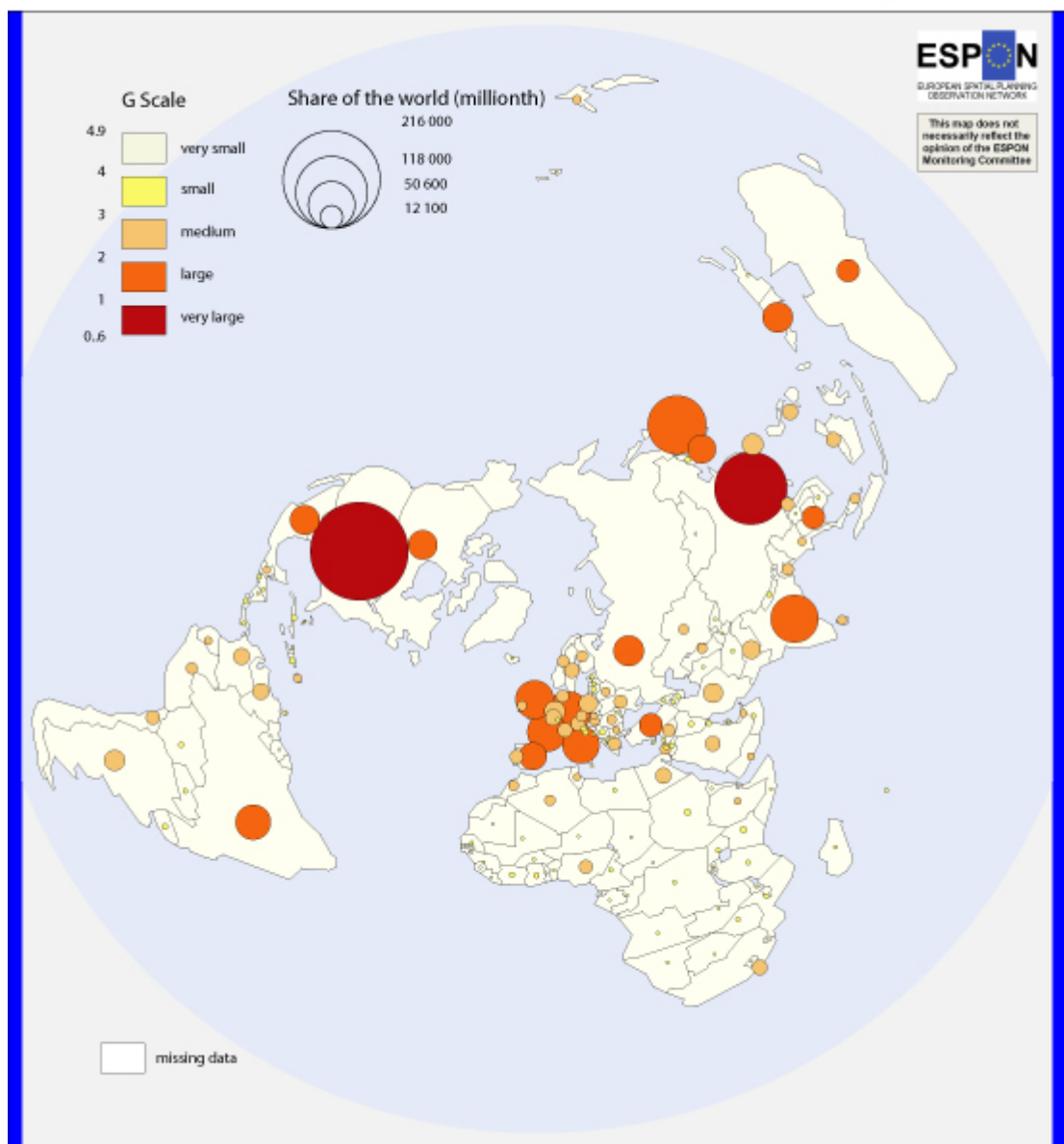
Map 8 : Share of the world GDP (ppp) in 1952

SHARE of the WORLD GDP in 1952 (5 years smoothing)
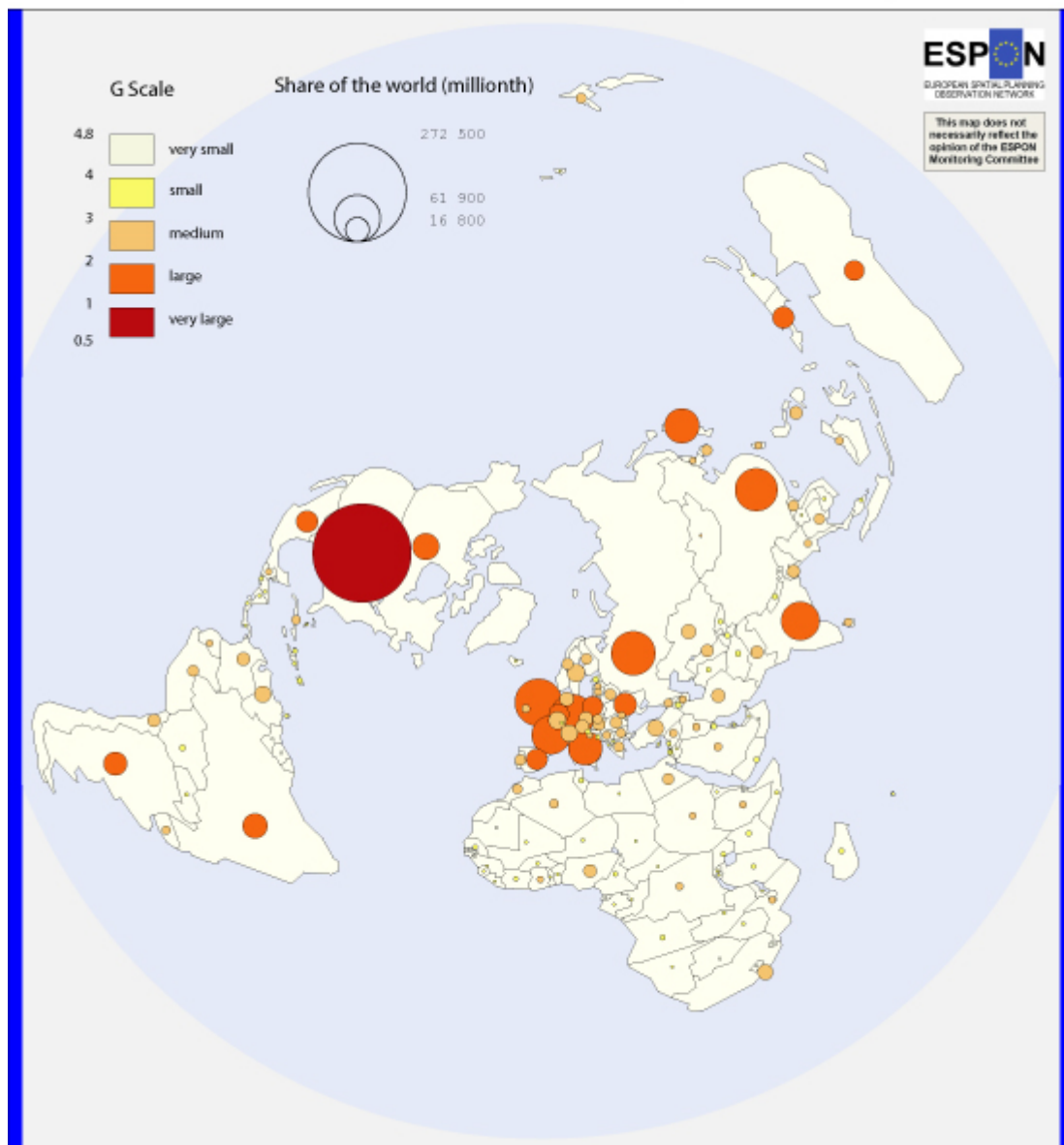
Map 9 : Share of the world GDP (ppp) in 1998

SHARE of the WORLD GDP in 1998 (5 years smoothing)

D.1.3.2 THE EVOLUTION OF THE WORLD GDP (PPPS) IN ABSOLUTE AND RELATIVE TERMS

Evolution of world GDP (ppps) in absolute terms
According to the figures of Maddisson database the GDP expressed in constant US $ of 1990 (Geary-Khamis PPPs), has experimented a positive variation in all selected 168 countries of the World without exceptions during the period 1952-1998. To avoid any misunderstanding of Map 10, it is important to pay attention to the fact that:

- *the evolution of the volume of GDP is not necessarily correlated to the evolution of the ratio of GDP per capita. If the growth of population is higher than the growth of GDP, the result is a decrease of economic well being.*
- *the evolution of GDP expressed in PPPs reflects the internal situation of States (corrected by level of prices) but not necessarily their international situation (i.e. their economic power on the global market) which is better described by GDP in current US $.*
- *the evolution of the GDP at the State level does not provide any information on potential inequalities in the social or territorial distribution inside each State .*

Having this in mind, we can notice the high level of heterogeneity of the variation of GDP PPPs both at the world level and inside the subgroup of States belonging to the ESPON area. If we exclude the small States with exceptional increase (multiplication by 15 for Malta), the most positive variations in the ESPON area are observed for Mediterranean countries like Spain, Portugal or Greece and the less favourable for UK, Switzerland and new member countries or candidate countries of East-Central Europe (Czech and Slovak republic, Bulgaria, Romania, Hungary, …)

Evolution of world GDP (ppps) in relative terms
Looking at the Map 11 it is clear that most States located in the ESPON territory (except above mentioned Mediterranean countries and Ireland) are characterised by a more or less important reduction of their share of world GDP PPPs. This reduction is generally less important than that observed for demographic criteria which means that, in practical terms, the level of GDP per capita has increased during the period 1952-1988 (*see next section*). The most important reduction of world economic share is observed for United Kingdom but should be cautiously interpreted because it is related at the same time to the long historical trend of decline of the British Empire and to the specific situation of world economy in the 1950's. The economic situation of United Kingdom and United States of America at the end of the Second World War remained more favourable than that of Germany, France or Japan which had to rebuild a large part of their economic infrastructure destroyed by the war. This initial situation explains why reduction of the economic share is more important for these countries and also for States which did not participate to war like Switzerland and Sweden. In the case of Soviet Union and former socialist countries, the explanation is different and the strong reduction of world share of GDP took place mainly after 1989 during the economic collapse which was produced by the transition towards market economy. Economic crisis explains also the reduction of world share of GDP in Argentina. The States which benefit from the most important increase of their share of world GDP PPPs are concentrated in Eastern Asia (especially Japan, China and South Korea) but can be described more generally as a *"golden ring"* which involves all States located southern from Europe, United States and Russia: Mexico, Brazil, S.E Mediterranean, Middle East, south and east Asia, north of Oceania).

**Map 10 : Annual average growth rate of GDP 1952-1998**

ANNUAL AVERAGE GROWTH YEAR of GDP between 1952 - 1998
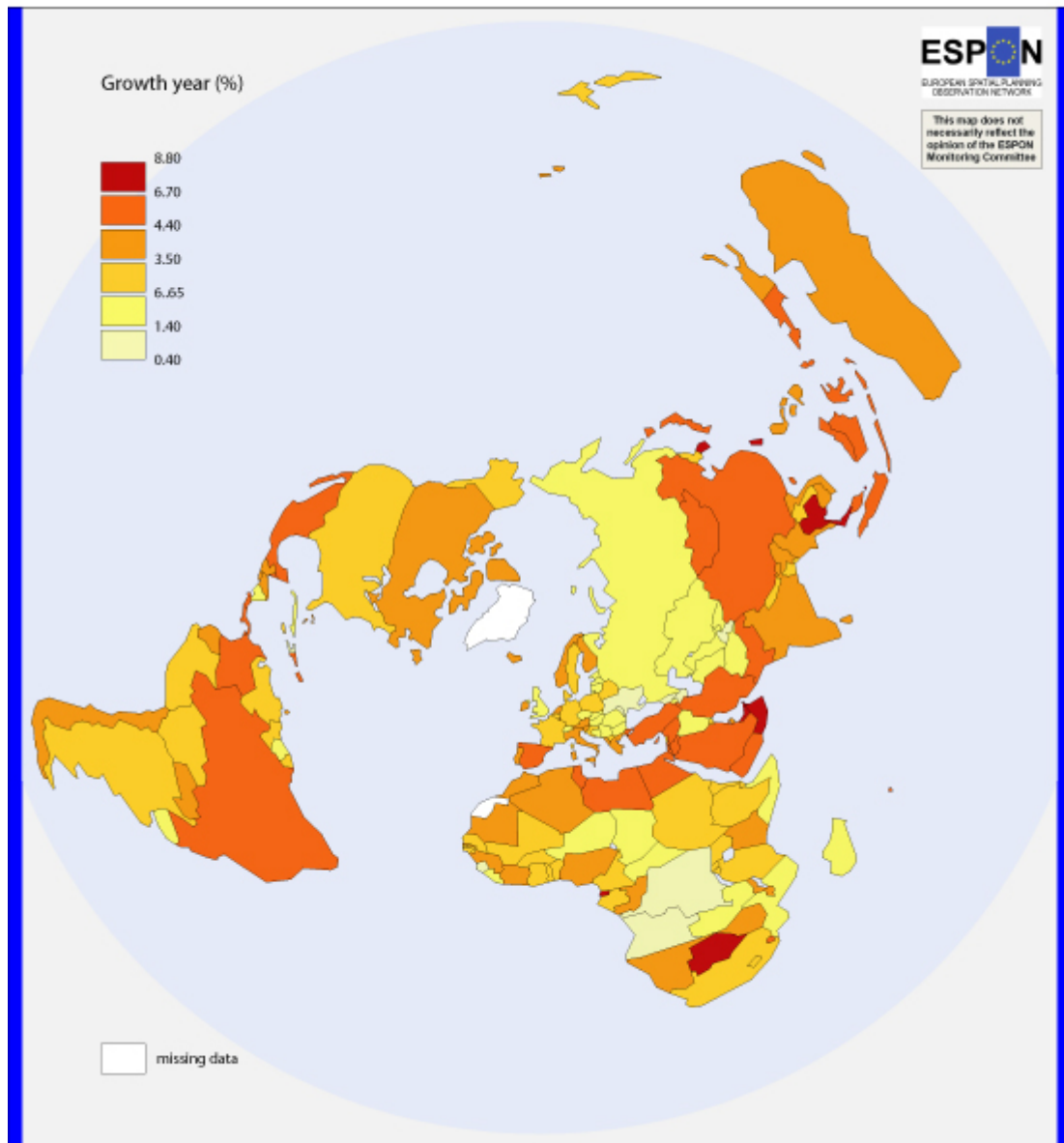
Growth year (%)

8.80
6.70
4.40
3.50
6..65
1.40
0.40

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Map 11 : Difference between world share of GDP (ppps) in 1952 and 1998

DIFFERENCE between SHARE of the WORLD GDP in 1998 and 1952
(five year smoothing)
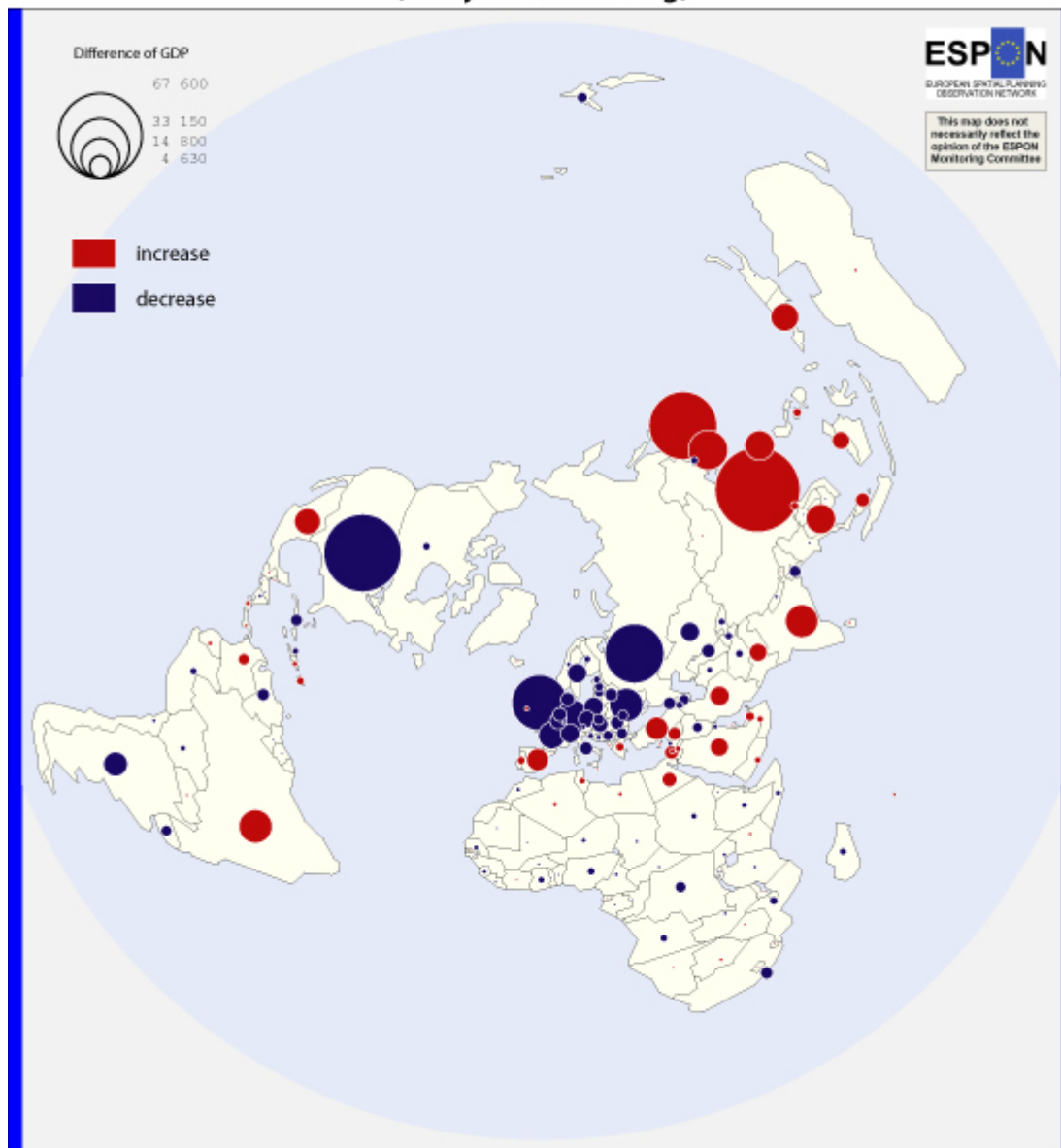
D.1.3.3 Typology of economic evolutions of world States (1952-1998)

As in the previous case of demography, the aim of this synthetic typology is to evaluate the specificity of the economic evolutions of each State with a cluster analysis. To take into account all years of the period 1952-1998 appears very important because the economic evolutions are more complex than the demographic ones (Map 12).

Type A: Growth followed by stability
States from type A are characterised by a very important increase of their economy during a first period (1950-1975) where their rate of increase of GDP is much higher than the world trend. After the increase of oil prices and the beginning of world economic crisis, a first subgroup (A.1) was able to maintain a rate of economic development higher than the world trend, either because they benefit from the increase of oil prices (Libya, Saudi Arabia, …) or because they were able to adapt to a new economic situation (Japan, Thailand, Tai-Wan, South Korea). A second subgroup (A.2) suffers much more from economic crisis and, after an important increase in the 1970's, turned to simple stabilisation of their world share of GDP: Brazil, Mexico, Spain, Turkey …

Type B: Stability followed by growth
States from type B are characterised by an opposite situation where the first period 1950-1975 was characterised by chaotic evolution of their economy, due to many political perturbations causing a rate of economic increase lower or equal to world trend. A first subgroup (type B.1) began to experiment an exponential economic growth since the 1970's and reached the highest rate of growth at world scale in the 1990's (China, Indonesia, Pakistan, Egypt). In another subgroup (type B.2), the same movement took place but ten years later and it is only after 1980 that they turned from decline to increase of their share of world economy (India, Vietnam, Chile, …).
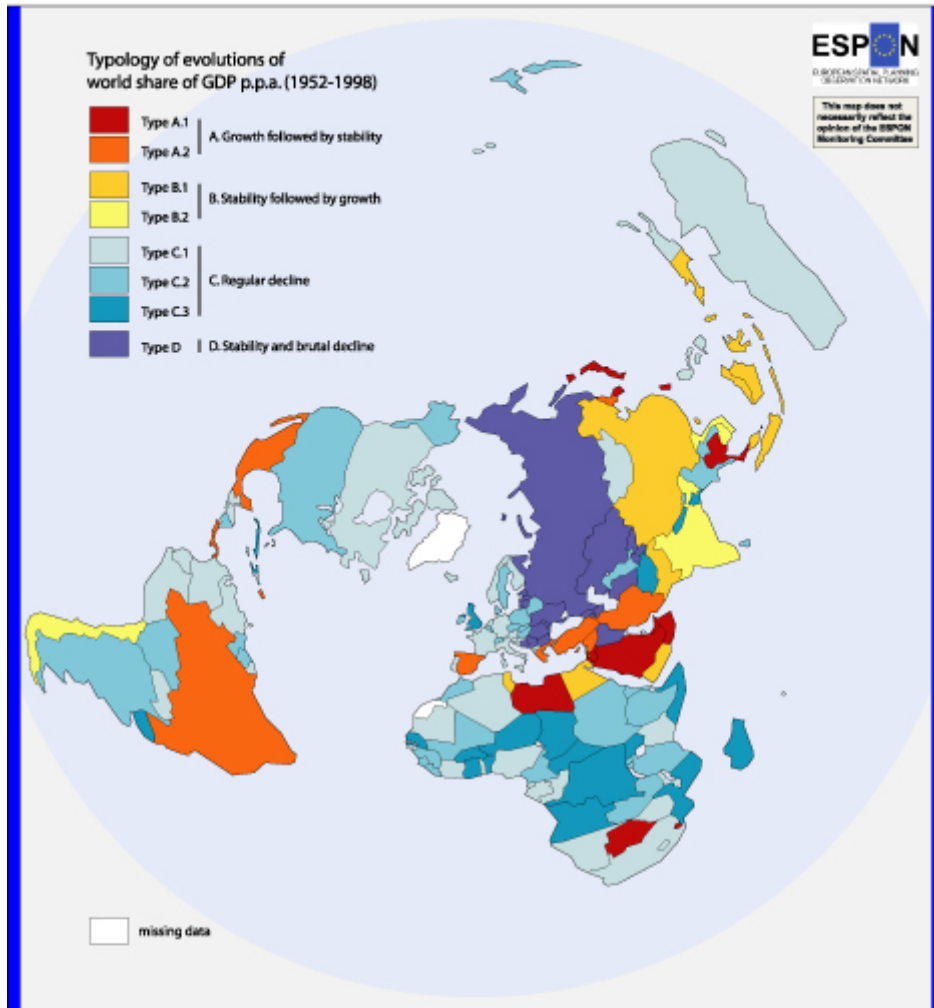
Type C: Regular decline
States from type C are characterised by the regular decline of their share in the world economy, whatever their initial situation of economic development was. This group can combine very industrialised States where the relative decline of the share of world GDP is a simple consequence of the low rate of population increase. But it can also be observed in underdeveloped countries with a lack of any significant economic take-off. The subgroup C.1 concerns a group of States of Western Europe (France, Germany, Italy …) where a slow increase of world share of GDP was followed by a slow decline after economic crisis of 1975. The subgroup C.2 is rather characteristic from countries of Central Europe (Poland, Hungary, Sweden …) which followed a regular trend of economic growth lower than world trend. The subgroup C.3 is similar but with lower rate of increase and an important reduction of world economic share: it is observed only for United Kingdom in Europe.

Type D: Stability and brutal decline after 1989
States from type D are mainly former republics of Soviet Union, or States which experimented war at the beginning of the 1990's (Yugoslavia, Iraq). They are characterised by a relative stability of their world share of GDP until 1980 and a beginning of slow decline during the period 1980-1990, which is very similar to the evolution of previous type C.1. Their main characteristic is the exceptional decline of their GDP between 1990 and 1998, due either to economic collapse (consequence of market liberalisation) or to political crisis (war).

Map 12 : Typology of economic evolution 1952-1998

EVOLUTION of the SHARE of the WORLD GDP 1950-54 to 1996-2000
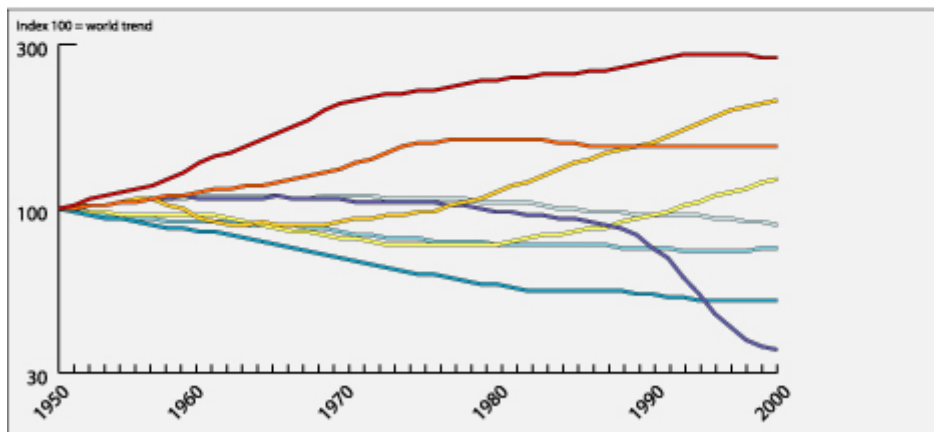
Typology of evolutions of
world share of GDP p.p.a. (1952-1998)

Type A.1
Type A.2
A. Growth followed by stability

Type B.1
Type B.2
B. Stability followed by growth

Type C.1
Type C.2
Type C.3
C. Regular decline

Type D
D. Stability and brutal decline

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missing data

Index 100 = world trend

300

100

30

1950   1960   1970   1980   1990   2000

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D.1.4 SYNTHETIC TYPOLOGY OF JOINT DEMOGRAPHIC AND ECONOMIC EVOLUTIONS OF WORLD STATES 1952-1998

The separated analysis of demographic and economic dynamics which has been realised in previous sections did not take into account the joint effects of both criteria which combines at the same time the evolution of *social cohesion* (if we suppose that GDP/inh. is an approximate measure of the welfare of inhabitants) and the evolution of *economic attractiveness* (positive or negative evolution of GDP and population). As in previous sections, we use the global economic and demographic trend of the World between 1952 and 1998 as reference which means that we focus on relative situation and not on absolute situations of countries. (Map 13).

D.1.4.1 GROUP A: POSITIVE DIVERGENCE

The most favourable situation according to our criteria is the situation of States which have simultaneously increased their share of population and GDP at world scale but with a higher rate of increase for GDP than for population. The States belonging to this group (A) have simultaneously increased their demographic and economic sizes which make them attractive from an economic point of view because they represent a potential market of growing size. At the same time, they have increased the GDP/inh. at a higher level than in the rest of the World, which means that social welfare have potentially been improved. But this improvement of social welfare is only a *potentiality* and depends also strongly on the equal or unequal repartition of the benefits of economic growth between social groups and regions of the States belonging to this category. Two different types can be distinguished in this group A.

Type A.1: Very strong economic growth associated with important demographic growth

The group A is characteristic of States of small or medium economic and demographic size which have developed exceptional comparative advantage in the global market during the whole period 1952-1998, generally associated with a strong level of specialisation. This specialisation can be related either to the presence of precious mineral resources (*Libya, Saudi Arabia, Qatar, Botswana*) or to high level of foreign direct investments and industrial relocation in an initial context of low wages (*Southern Korea, Taiwan, Thailand*), or to the massive support of the economy by diasporas and allied countries (*Israel*). Most countries of this group are characterised by very high level of social inequalities and the existence of minorities or foreign workers excluded from the redistribution process. This type of exceptional growth concerns 13 States but a rather limited amount of world population (2.3% in 1952 and 3.0% in 1998) and world economy (1.2% in 1952 and 5.2% in 1998).

Type A.2: Very strong economic growth after 1975

The group B is limited to 5 countries. It involves two demographic giants (*China and Indonesia*) and 3 very small States or territories (*Mauritius, Equatorial Guinea, West Bank and Gaza*). The main characteristic of this group is the very high level of economic growth after 1975, associated with a stabilisation or at least a reduction of the rate of demographic growth. The combination of both effects is a very important increase of GDP/inh during the 1980's and the 1990's. This group B represents more or less for a quarter of the world population during the whole period (25.1% in 1952 and 24.7% in 1998) but its share of world

GDP has been multiplied by two (6.4% in 1952 and 13.9% in 1998). Actually, the GDP/inh. of the States of this group is more or less half of the mean of the World.

D.1.4.2 GROUP B: POSITIVE EQUILIBRIUM

The group B is composed by States which have experienced a significant growth of their share of world population and GDP but without advantage for one criteria. It means that the ratio of GDP/inh. of these States has more or less followed the world trend. Accordingly, the States of this group are economically attractive because the size of their market is increasing and the social welfare of their inhabitants has followed the "mean" evolution of the World which means that their "social attractivity" has not changed positively or negatively during the period. This group of 34 countries is mainly located in the "golden ring" of countries located in southern periphery of the triad. It associates States of large size (*Mexico, Brazil, Egypt, Turkey, Iran, Pakistan, Philippines or Malaysia*) with small and medium States (*Ecuador, Colombia, Algeria, Tunisia, Syria, Mongolia …*). It can be noticed than some countries of equatorial Africa also belong of this group (*Côte d'Ivoire, Kenya, Congo …*). Between 1952 and 1998, this group of emerging and new industrialised countries has increased its share of world population from 11.3% to 16.2% and its share of world GDP from 7.4% to 11.3%.

D.1.4.3 GROUP C: « GOLDEN DECLINE »

The group C is characterised in the same time by a strong demographic decline and an increase or relative stability of GDP. We propose to call this very original situation "golden decline" because it characterises States where declining population are becoming more and more rich as compared to the world trend of GDP/inh.

Type C.1: Japan's variant of golden decline

The most extreme example of this model of "golden decline" is provided by Japan which has multiplied by two its share of world GDP (3.4% in 1952 and 7.7% in 1998) while its share of world population was strongly reduced (3.3% in 1952 and 2.1% in 1998). As a result, the GDP/inh of Japan which was more or less equal to the world average in 1952 is actually 3.7 times greater!

Type C.2: Europe's variant of golden decline

Another variant of the model of "golden decline" can be found in Europe where many States has experimented an important decline of their share of world population associated with a stability or very small decline of their share of world GDP. This situation is very frequent in western part of Europe (*Spain, Portugal, Netherlands, Germany, Italy, Norway, Austria*) but also in Balkans (*Romania, Bulgaria, Greece…*). This type C.2 is not observed out of Europe, except in the very particular case of Puerto Rico. The population of the 20 States of this type has experimented a severe decline at the world scale (10.5% in 1952 and 6.0% in 1998) but their GDP has been very few reduced (17.9% in 1952 and 15.9% in 1998). As a result, the GDP/inh of these States which was more or less the double of world average in 1952 is actually the triple.

D.1.4.4 GROUP D: NEGATIVE EQUILIBRIUM

The group D defines States which have experienced a significant decline of their share of world population and GDP but without advantage for one criterion. It means that the ratio of GDP/inh. of these States has more or less followed the world trend as in the case of previous group B, but for opposite reasons. Accordingly, the States of this group D are less and less attractive because the size of their market is decreasing demographically and economically at the world scale. The States of this group are firstly *United States, United Kingdom* and former republics of soviet Union (*Russia, Ukraine, Belarus …*) and Warsaw Pact (*Poland, Hungary, Czech and Slovak republics, ...*) for which one possible explanation of the low level of increase of GDP could be the expenses of armies (nuclear weapon, ships, …) during the cold war. This situation is also characteristic of States which did not participated to the Second World War and took benefit from their neutrality (*Switzerland, Sweden*) which explains their very high level of GDP in 1952 and their relative more important decline later. Despite its decline, this group of 20 States still represents a very significant part of the world GDP (46.7% in 1952 and 31.2% in 1998) and the world population (17.1% in 1952 and 11.2% in 1998).

D.1.4.5 GROUP E: NEGATIVE DIVERGENCE

States from group E are characterised by the most critical situation which is an increase of their share of world population associated with a decrease of their share of world GDP, which implies that their GDP/inh. is growing more slowly than the world trend or eventually becomes negative. Two different types can be defined according to the level of divergence between economic and demographic trends.

Type E.1: Small negative divergence or global stability

An important group of States of medium and large size (Canada, India, Australia, Southern Africa, Nigeria, Peru, Vietnam, Bangladesh …) and some States of smaller size (Cameroon, Gabon, Venezuela…) presents the characteristics of small negative divergence which can recover in certain cases a perfect stability of the share of world population and GDP in other cases, small oscillations during the period 1952-1998. The 37 States of this group which has more or less followed the world trends is a significant part of world population (22.2% in 1952 and 26.8% in 1998) and world economy (12.3% in 1952 and 11.8% in 1998).

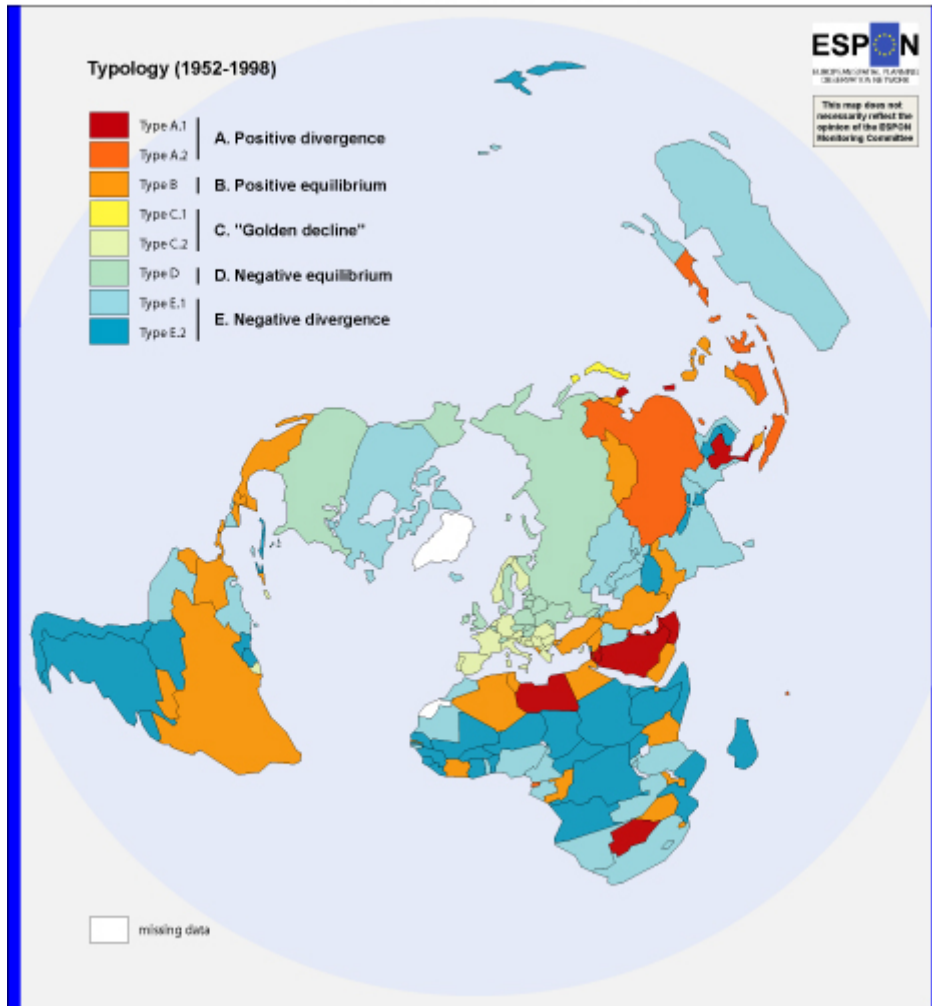### Type E.2: High negative divergence with increasing poverty

With this group of 36 States of small and medium size, except for some cases, we explore the most negative scenario of evolution which is exactly the contrary of the situation of "Golden decline" observed in group C. For many States from group E.2, the diverging evolution of GDP and population produces not only a lower rate of increase of GDP/inh. than in the rest of the World but and absolute and effective decline of economic conditions in absolute terms. In many cases the economic problems are reinforced by political crisis and wars (*Afghanistan, Congo R.D., Sudan, Laos ...)* or by the action of international organisation which claim for structural reforms producing growing social poverty (*Argentina, Chile ...)*. The small size of most States of this group make very difficult any action of State and any policy of economic or political independency. In 1998, the 36 States from type E.2 counts for 10.0% of the world population (8.2% in 1952) with only 2.9% of world GDP (4.7% in 1952).

Map 13 : Synthetic typology of demographic and economic evolution (1952-1998)

JOINT EVOLUTION of the SHARE of the WORLD POPULATION and GDP from 1950-54 to 1996-2000
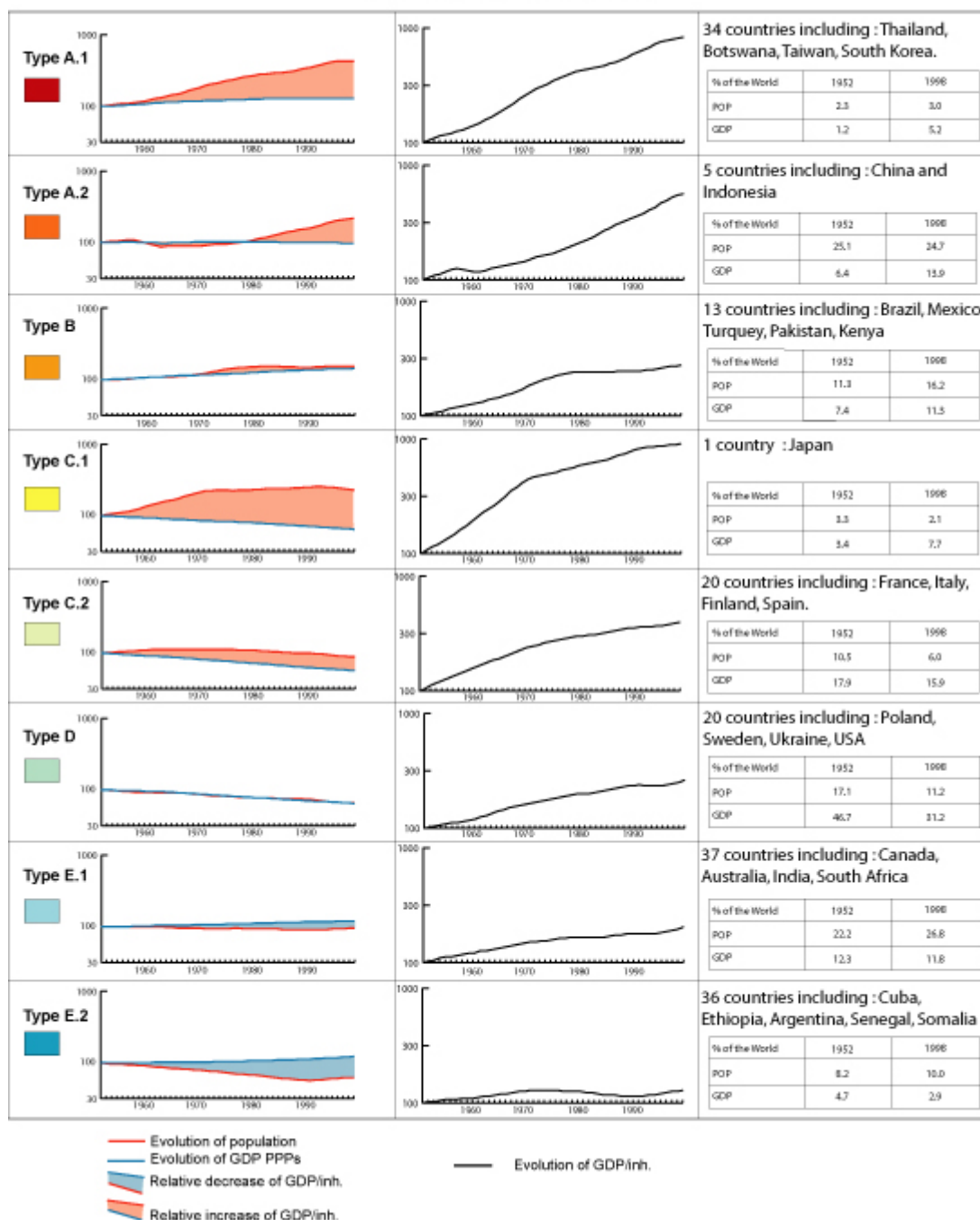
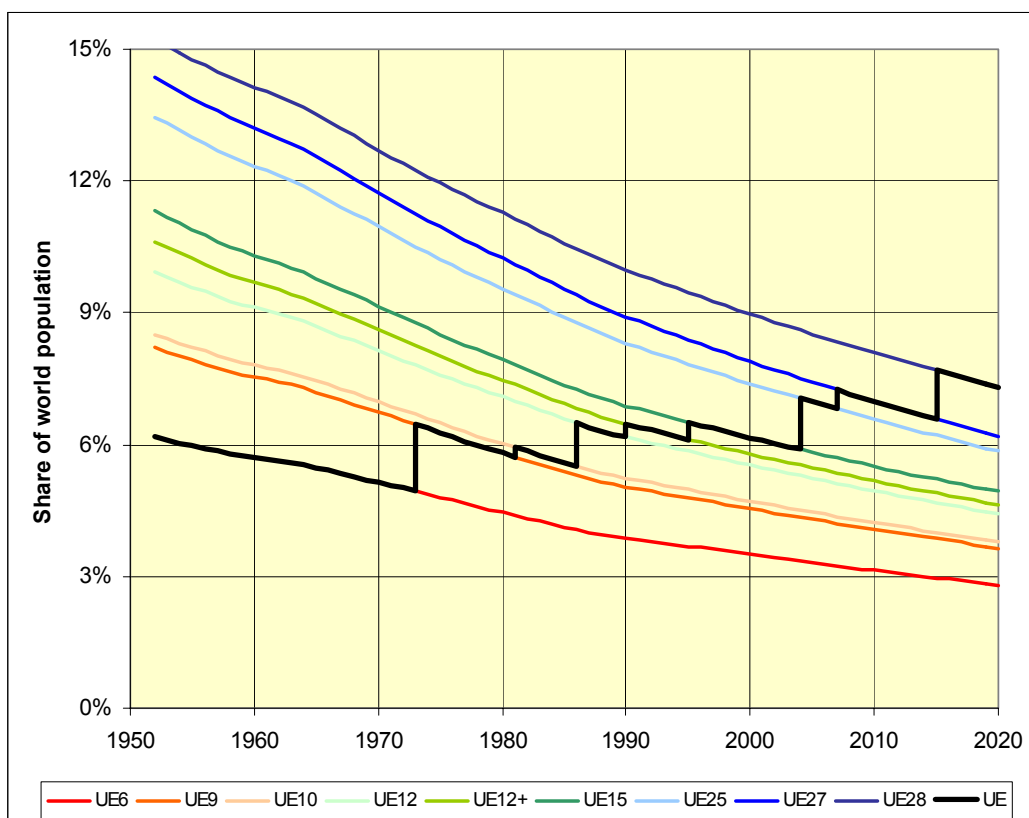# JOINT EVOLUTION of the SHARE of the WORLD POPULATION and GDP PPPs from 1950-54 to 1996-2000

Typology (1952-1998)

ESPON

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Type A.1	A. Positive divergence
Type A.2	
Type B	B. Positive equilibrium
Type C.1	C. "Golden decline"
Type C.2	
Type D	D. Negative equilibrium
Type E.1	E. Negative divergence
Type E.2	

missing data

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D.1.5 CONCLUSION: THE EFFECT OF POLITICAL ENLARGEMENT ON THE ECONOMIC AND DEMOGRAPHIC DYNAMIC OF THE EUROPEAN UNION

In conclusion, we would like to underline that the fact to use the division of World between States for the analysis of territorial evolution of Europe is a strong limitation because it doesn't take into account the regional dimension of the phenomena (region is understood here has division of the World) and the dynamic of political divisions. The evolution of population or GDP of the European Union between 1950 and 2004 is a very fascinating example of dynamic of political division because during the whole period we observe a structural trend of demographic and economical decline (**figures 1 and 2**) which is always balanced by a political dynamic of enlargement.

- **The population** of EU6 in 1950 was more or less equal to 6% of the World but would have declined to 3% in 2000 without enlargement. On the contrary, the share of world population located in the European Union has remained very stable around 6% when EU enlarged to 9, 10, 12 and 15 members. With the enlargement to 25 members in 2004, the share of world population located in the EU has reached an historical record of 7% and could jump to 8% with the adhesion of Romania, Bulgaria and Turkey between 2007 and 2015. In other words, demographic decline is not a fatality for European Union from a political point of view.

- **The GDP** of EU6 in 1950 was more or less equal to 15% but would have declined to 10% in 2010 without further enlargement of the political union. The membership of United Kingdom in 1973 has produced a decisive increase of this share which reached 20% and remained very stable around this level when Europe enlarged to 10, 12, 15 or 25 members. But the trend to economic decline of the area remains important and it is only with further enlargement to countries like Turkey in 2015 that European Union can eventually maintain this share of 20% of world economy in the future.

Figure 27 : Evolution of the share of world population of the European Union (1950-2020)

Figure 28 : Evolution of the share of world GDP (ppps) of the European Union (1950-2020)
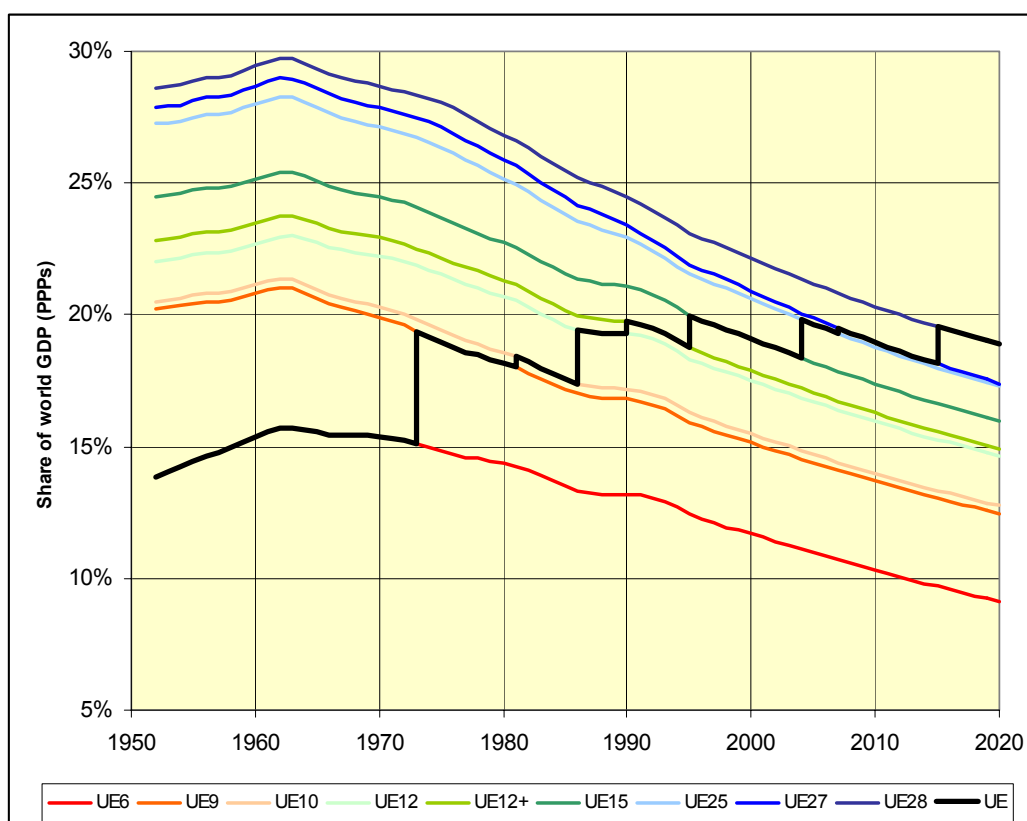
D.2 ANALYSIS OF EXTERNAL TRADE AND INVESTMENT FLOWS

Pablo Medina, Christian Vandermotten

International flows are to a large extent dominated by exchanges between the countries of the centre. This traditional predomination has been confirmed by recent trends, as a result of the volume of internal exchanges between those countries and of the relative decrease in the share of raw materials in world trade.

Intra-European exchanges, which represents nearly 25% of the world trade (for a large part intra-EU), might in the future be removed from the statistics as a consequence of the creation of a single European market, in which the crossing of internal borders would no longer be taken into account.

Among the peripheral countries, the East Asian countries are the only ones that increase their share in the world trade significantly (mainly Korea, the ASEAN countries, and China). The high sales volume of manufactured products from peripheral to developed countries, or to other countries of the periphery, concerns in fact only a small number of countries. More than 50% of those sales come exclusively from the East-Asian NICs (more than 2/3 if we include China).

Western Europe is above all characterized by the high amount of intra-European international exchanges, partly reflecting Europe's political splitting, but getting stronger as the European economic integration goes on. Until World War 2, Western Europe was considered as the major crossroads of international trade. Today it has regained the position of principal commercial partner of the countries of the former Soviet sphere, lost in the aftermath of Word War 2.

In a context of classic exchanges of manufactured goods against raw materials, Western Europe keeps dominating Africa's commercial relations, even if the latter have greatly lost in relative importance, whereas that continent had remained the main commercial partner of Western Europe until in the 1960s.

With the Middle-East, Western Europe maintains privileged relationships, less exclusive than in the past, but now characterized by a surplus balance.

Western Europe's relations with Western Asia are losing in relative importance, due to the increased strength of an Asian area. The British supremacy in the relations with Australasia has come to an end, as this continent turns to the Asian Pacific pole as well.

Latin America's external trade has gradually broken away from Europe for the last thirty years to the advantage of the USA or of intra-continental relationships.

Trade exchanges with the Northern Atlantic are significant in terms of volume and relatively evenly distributed, despite the fact that the trade balance, for a long time favourable to the USA, has now reversed in favour of Western Europe.

In the next phase of the project, we will examine the nodes underlying the relationships between companies throughout the European space. In this context, it will also be instructive to appraise the place of the European firms among the big international companies (Europe, the place of multinationals). The part of national and non-European assets held by the big European companies can also be examined. At the same time, we will study the major commercial flows :
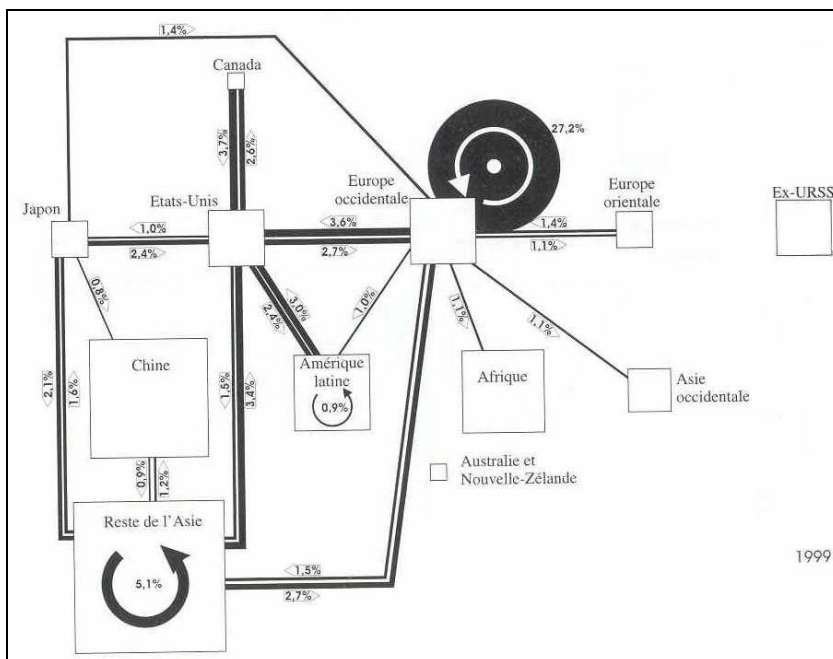
1) In Europe: how is the European economic space organized?
2) From Europe: how is Europe connected to the other continents?

Finally, we will look into the insertion of the European cities in high standard services and in big international networks.

Figure 29 : Major international trade flows in 1963
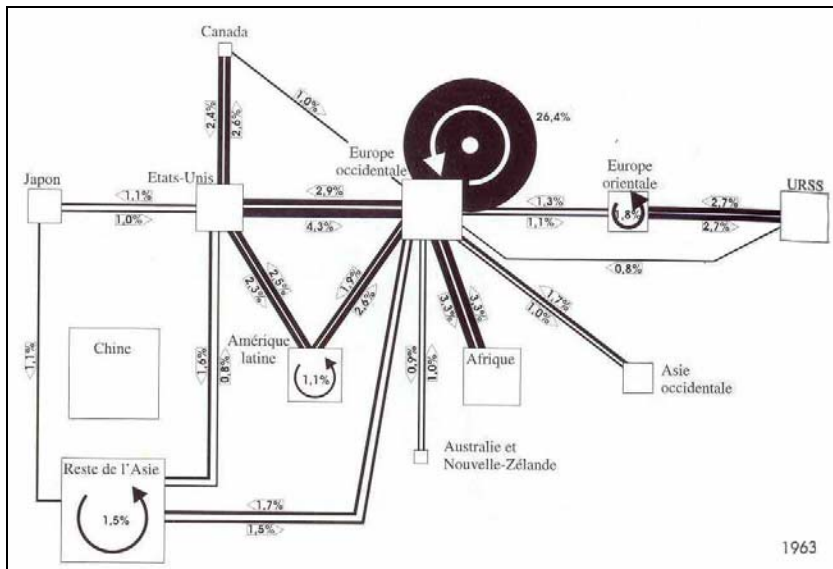
Figure 30 : Major international trade flows in 1999

Keys for the figures: The squares representing the continental blocks are proportional to population size. The thickness of the lines is proportional to the flows as far as the latter account for at least 0.75% of the world trade

E KEY QUESTIONS

E.1 KEY QUESTION 1: DELIMITATION OF WORLD REGIONS
C. Didelon, C. Grasland, C. Grataloup

This text is mainly based on a translation of a C. Grataloup paper to be published in a dictionary of globalisation. Its aim is to serve as a conceptual and theoretical point of departure of reflections and analyses of this key question.

Globalisation is not a synonym of « end of history ». From 1914 to 1991, the geopolitical world scene was dominated by confrontations between blocs. Before the First World War, despite colonial rivalries, the economic integration of world leading powers was very strong. This first globalisation has been interrupted by the war and its consequences, USSR and fascist government births. The cold war prolonged until the eighties the splits that were dividing the humankind in hostile "worlds". With the decolonization the North/South division have been added to the East/West one. In April 1955, Bandoeng, marked the birth of a "third world".

With the end of the cold war, one could think that there would be a shift from a plural world to a singular one. However, "civilisations" appeared to be resistant in the global context. Now, facing obvious signs of uniformisation and an as much dynamic diversity, one does not know anymore how to divide the world. Economic regionalisation, geopolitics recomposition and cultural resistance draw divisions that do not match and interfere with each other drawing a fragmented picture. As we do not know any more how to classify simply the places, we still divide the world in a way we consider as neutral: the continents.

E.1.1 THE TRIAD AND ITS REGIONS

The development of a world trade space that has more and more resonance does not mean a dilution of economic hubs, quite the opposite. If manufacturing activities are affected by relocation it is not the case for major central activities (stock exchange, big firms management, very high level research) that still remain concentrated in few central places. The later are embodied in three major urban areas, three megalopolis. The most important one, the one for which the word have been invented, is still the North-East of the United States. The European axis, from Milan to London is the older. Since about thirty years the urban area of southern Japan is the third centre. This triple core of the world, often called "triad", is continuously recomposing itself both concerning the internal structure of each of its parts (with for example the development of Shanghai in East Asia) and the opposition between them. However, at a global scale, what is stinking is the "world-cities" stability compared to the flexibility of the shapes and localisations of more usual production activities. The stability of the world economic core can be explained by the rarity of activities that are done their but also by the systemic cohesion of the hole that allow a continuous work: we could say that triad members operate three eight-hour shifts. On the global stock exchange the sun never set down; when a stock market closes one is at work. As a testimony of this interdependency the major economic flows are between those three centres.

Peripheries are organised around those major centres. Other big cities, high level industrial centres, intensives agricultural productions are close from them. A high density tourist spaces are developed in their souths (Caribbean, Mediterranean Sea, and South China Sea). Centres influence the structure of the margins (Central America, Maghreb, South East

Asia), that are subjected to migratory flows and are spaces for the relocation of production and service activities. This first way of interpretation of the global space associate a ring of three centres each one organizing a southern space, a zone innervated by major migratory flows.

E.1.2 THE NORTH – SOUTH OPPOSITION IS STILL NOT OBSOLETE.

We can make a transversal lecture of the World from the one that have just been drawn. All the dominated peripheries, where the development indicator by capita is usually weak, are spaces located at the south of rich regions. The use of the expression North/South is an inadapted language habit, because the more southern space are not always the poorest. The expression "small triad" is sometime used to name the spaces counterparting the north centres: Australia and New Zealand, South Africa, Latin-America. As the economic expressions (under-developed countries) or politic ones (Third-World) seem to belong to a bygone past, the use of cardinal points seems to be more politically correct. It also avoids using deterministic expressions that oppose temperate and tropical regions.

It is difficult, today, to consider the developing countries as a homogeneous whole, as it was possible in the sixties and seventies. But it is not possible to ignore the importance of the living standards gap between countries. Indeed, the clear lines that were formerly drawn on the maps, following the shape of the Rio Grande, the Mediterranean Sea and the Amur River are now replaced by non continuous gradients from post-industrial countries to less advanced countries. Social gap within each country can be often more important than between national averages, but social differences between societies are still there. The North-South reading grid, even if changed in gradients, is still meaningful.

The Third-World block disintegrated at each end. At one end, countries that were considered as under-developed fifty years ago, like South Korea, joined OEDC. The so-called emerging countries are following the same path. On the other end, less advanced countries, mostly African ones, are sinking in disorganisation. Former members of the soviet block are now scattered between the rich club (Baltic countries), intermediate situation (Russia), emerging (Vietnam), and poor (Cuba). Is a binary view of the world is only relevant for caricatures confronting two "hemispheres", the gap between a world composed of rich people and larges (and densely populated) territories of poverty is still a topical subject, and doubtless for still a long time.

On the other hand, what becomes less and less meaningful is the political aspect of such classifications. During Bandoeng, in the middle of decolonisation, the link seemed to be obvious between under-development and colonial inheritance. When trying to set up the third block of non-aligned countries, distinct from the blocks of the cold war, Third World leaders were using, reversing it, the inheritance of former imperialism. At the beginning of the XXIst century, the configurations have changed, but that does not mean that a geopolitical interpretation is no more accurate, on the opposite.

E.1.3 PERMANENT FEATURE AND GEOPOLITICAL CHANGES

Secant to the north-south cut, the east-west gap was a major division of the world during the cold war. The Iron Curtain (or bamboos one) was still there to remind this major opposition between two competing projects on globalisation, socialism and capitalism. No school book could give a presentation of Europe or of the World without a picture of the Berlin Wall. If, since 1991, there are still some countries claiming, more and more discretely, to be socialist, they now often add "market", like China or Vietnam. In North Korea the reference to communism is only used to underline the opposition to the rest of the world. Concerning the castroist state, its duration is now only due to the US embargo.

The time of firm great alliances, binded by the fear, is no more. The NATO remains only at the price of a reconversion in the function of world police force, intermediary between the unilateral force of the United-States and blue helmets. Not any link that was formerly privileged is safe from a simple electoral shift. Even the old complicity between United-Kingdom and United States seems now fragile. Russia has difficulties to keep its influence in its "close foreign countries". And yet the nuclear arsenals are still there. Their modernisation is even expected. The weight of the Cold War winner have more and more difficulties to hide a group of big and medium powers whose geo-strategic games organize the international scene according to realpolitiks in which ideology is no more present except for the USA. In the same time the shadow of China is becoming more and more distinct.

One could be tempted to see under that geopolitical game the one of civilisation that one was pleased to discover again at the end of the twenties century. Such a reduction forgot that it is a matter of States: the state division is still the only official strong structure that clearly divides the World. Those interrelations between states are embodying the international level that is a contradictory process and at the same time a part of the global order. Because it is an association of states the UN embodied what, at the international level, slow down or speed up the reinforcement of world societal level. On one hand a decision can be blocked if some countries or one of the Security Council members vote against it. On the other hand most of global questions are discussed, and even, sometimes resolved; a lot of UN agencies or parallel organisms reach a level of autonomy that allows them to act as global actors.

E.1.4 THE DIALOGUE BETWEEN CIVILISATIONS

At the beginning of the nineties, the thoughts on the world, missing the clear structure of the cardinal points, start to use again the major division criteria of the civilisation that was formulated since the Eighteen century. This secular reading grid itself inherited from a classification of people according to religion. So, the civilisation criterion is often used to turn Islam in the adversary of a western and capitalist globalisation. Even if this new binary vision is too simple, (although it is not unfounded), the geography of civilisation is very long-lasting. One can't not ignore it so long their is no confusion between civilisation and religion.

The civilisation scale has not to be crushed. The idea of "great" civilisation reminds the simplistic evolutionist thoughts of the nineteen century. But the size means nothing and there have been, and still have, societies with small number of people but having very particular identity elements. One can even observe that globalisation, concurrencing the state level that were oppressing them, allow to premier, autochthonous, native people to rebuild their identity; Chiapas Indian make a clever mediatic version.

There is another trap that must be avoided: to consider the map as fixed. Civilisation exists only through men and women that live them, transform them and transmit them. The present globalisation did not invent the interbreeding, but make its intensity grow. Whereas

since three centuries the western thought make an opposition between civilisations in the plural, tool to make a hierarchical classification of humankind, and the Civilisation in the singular, the most evoluted way of live (that obviously they applied to themselves), a global multiscalar civilisation can be drawn today. Otherwise the confrontation between civilisations is only the mask of the geopolitical game.

E.1.5 AND STILL, FOR LACK OF ANYTHING BETTER, THE CONTINENTS.

Sometimes, it is difficult today to not regret the fifties-seventies period when World War and Third World allow dividing the world in an educational way. This simplicity was however a delusion, an obstacle to perceive the dynamics that were producing our current world (end of the soviet model, emergence of new industrialised countries, fondamentalistics reactions...). Maybe the fact that western and eastern point of view shared a common evolutionist origin, both thinking themselves as the source of the progress, produced a classification that was more temporal than spatial. The World was divided between backwards (proslavery, feudal and underdeveloped states), intermediate (developing, capitalist) advanced (developed countries, liberal or socialist governments). It is maybe the "development school" that formalised the couple "centre-periphery" as a view of the world, and first propose a synchronic vision of classifications (development, underdevelopment). Today the reflexions on the world follow a different stream of historicity for which great historical visions are suspicious. Privileging the present, they give an advantage to synchronic divisions that are basically spatial ones. But if one suspected the civilisation grid too, it only remains to classified the places of the world to look for natural, or supposed "natural", divisions.

A relevant example is the new museum in Paris which will replace the Musée de l'Homme. The latter opened in 1937 was totally organised following the evolutionist point of view, from prehistoric times to ethnograph's native people themselves classified between hunter-gatherer, farmer, pastor. Today this point of view is no more bearable. However we did not know what kind of new classification to propose and the new collection will be distributed between four sections: Africa, America, Asia and Oceania... No consensual name was either determined for the institution, still carefully named "Musée du Quai Branly". The use of the old parts of the world show a mistrust against whatever supposed hierarchy between people and so the seek for neutral categories. Of course the absence of Europe is not innocent.

So, are the continents a so neutral way of dividing the World? The most basic definition of a continent is "large area of emerged land" and it is opposed to islands and archipelagos that are separated by sea and oceans. Sometime the notion of contiguity is added to define a continent. Five continents are usually distinguished (Europe, Asia, Africa, America, Oceania), but they are sometime seven with two Americas and the Antarctic. So let's have a look to an objective document: a map of the tectonic plates.

Figure 31 : Tectonic plates
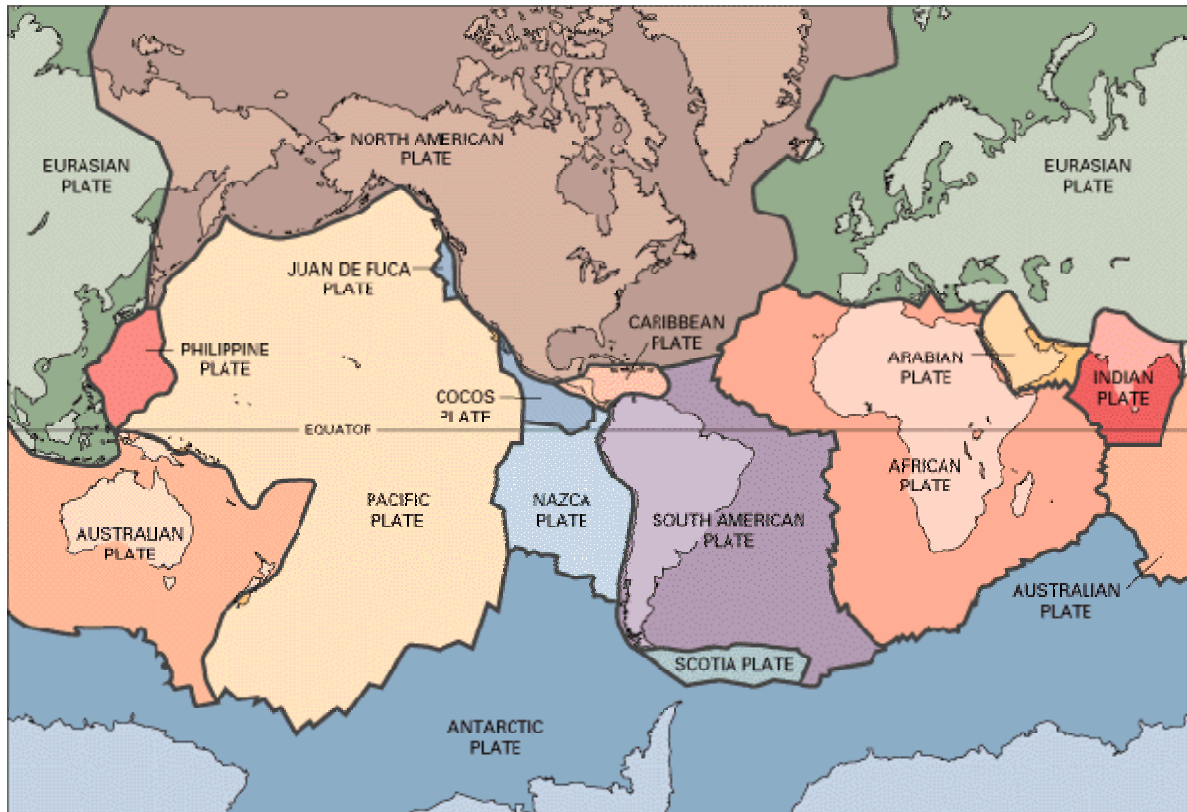
Source: http://pubs.usgs.gov/publications/text/slabs.html (U.S. Geological Survey website)

As the above tectonic plates maps allow to observe, Europe can not really be considered, in a geological point of view, as a continent but as a kind of peninsula of the Eurasian Plate. The Asiatic continent is divided in an Arabian Plate, an Indian Plate, an Eurasian Plate and even a North American Plate. America is neither a continent as a whole but is divided in North American Plate, South American Plate, and a small quasi-oceanic Caribbean Plate. Last but not least, both the usual definition of a continent and the tectonic plate map allow to observe that the Antarctic is a continent, but it is always forgotten, maybe because we consider as a continent a populated land.

The concept of continent seems to be weak considering geographic realities. It is pretend to ignore that continents are not natural facts, great islands, but a projection on the World map of the European vision inherited from medieval divisions (*Orbis Terrarum Maps*). This division of the world was built mainly in a Christian point of view, where the world is unified, surrounded by an ocean and divided in three parts, Europe, Asia and Africa, inherited from the Myth of the son of Noah[16]. Objectively, only Americas are an autonomous whole as proximity had effects. But the delimitations between Asia, Europe and Africa are a product of a civilisation arbitrary. Concerning Oceania, its name itself object its continental existence.

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[16] Noah Divided the Earth between is three sons: Shem got the centre of the world, Ham the South and Japheth the North. They shared themselves their part between their sons in one hundred and four countries and ninety-nine islands, organised in Seventy-two nations, each one having its own language and using sixteen different kind of writing.

The Olympic Rings is one more example of the cultural and civilisational perception of the continents:

Figure 32 : Olympic rings
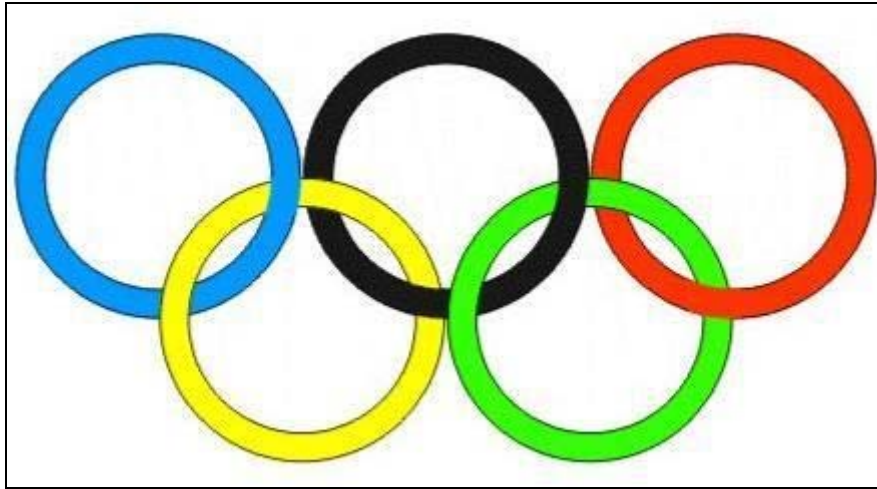
The Olympics rings are the symbol used on the legal flag of the Olympic Games that was proposed by Pierre de Coubertin in 1914. They are known all over the world and they are a symbol of the universality of the Olympic Games. It is made of five rings that represent the "*five parts of the world*" as M. de Coubertin said or the "*five continents*" as almost everybody say (including the International Olympic Committee (*http://www.olympic.org/*)). They represent Africa, America, Asia, Europe and Oceania.

It is often said that the Blue colour is for Europe, the Yellow for Asia, Black for Africa, Green for Oceania and Red for America. The White colour of the background would then represent the "Peace". In fact, in the conception of M. de Coubertin, the colours do not symbolised the continents. The six colours are those usually used in all the flags of all the countries of the world. We could observe that concerning the wrong interpretation of the ring's colours three of them are affected to continents according to the usual denomination of the skin colour. The yellow colour is also the one of the Chinese Emperor. Blue should be logically used for Oceania, but is used for Europe maybe because the blue colour is the one that a majority of European people prefer, or because in the recent history is the colour of the European flag (is also in a European religious point of view the colour of the Virgin Mary). Then the green is used for Oceania because is it the sole colour not yet used.

Thus Olympic rings propose a division of the world in five parts, five continents that could seem to be an objective one. But the common perceived symbol of the rings colour is a kind of cultural projection of the division based on a perceived division of human kind according to skin colour.

E.1.6 CONCLUSION

The globalisation was accelerated when, and we were aware of it, when barriers and frontiers that were dividing the world from 1914 till the eighties came down... The assertion of this global level make difficult the thought of the division of the world in subsets and more especially as the evidence of anterior camps did not encourage us to produce a reflexion on regional diversity. Missing East/West and South/North couple, we now use an univariate grid that still on the long terms of civilisations or nature. To take in account all dimensions of the

global social aspects become then more difficult: economic regionalisation do not obviously match with civilisation area, and neither with continental conventions. The vocabulary is becoming more and more dubious; what is now the meaning of "Asia"? More and more in statistical tables or in newspapers the "Middle East" (from an European point of view) is not in Asia, but Australia it is sometimes in (that is not absurd when considering economic regionalisation and Triad zones. But what is not surprising in an economic point of view would become shocking in a cultural analysis (if, for example one would qualify Australia as being Eastern).

What is at stake is to think/classify the World and its regions in a complex way, at least taking in account many criterias at the same time. If the global level as a meaning, then it logically produces a differentiated space. It inherited from multiple diversities, it fades them or uses them, but it also produces some kind of differentiations economic, cultural as well as politics ones. Thinking parts of the world, its thinking the all world, at the same time all the social aspects and all the places. What a great work!

Fortunately, the world is not simple.

E.1.7 DISCUSSION FOR THE KEY QUESTION DIVISION OF THE WORLD

After this theoretical and historical discussion about the divisions of the world, the question is, concerning our Key Question "division of the world", which type of world regions will be elaborated in ESPON 3.4.1, on which criteria? The following part aims to summarize the different definitions of a region.

E.1.7.1 GENERAL DEFINITION OF A REGION

In the case of a state: regions can be defined as: « the last level of economic, social, political, integration under the national level » (Juillard). In the case of the World: regions can be defined in the same way as the « last level of economic, social, political… integration under the global level »

E.1.7.2 POLITICAL REGIONS

Political regions: are defined on the basis of treaty or other juridical criteria which limit the sovereignty of states participating to the construction and agree to share certain areas of political decision. Various types of political regions can be defined according to the field of political action which are shared (economy, army, culture…) and the degree of transfer of sovereignty to regional level.

E.1.7.3 HOMOGENEOUS REGIONS

Homogeneous regions are defined by an observer which use one or several criteria of similarity which can be of very different type but are generally related to structural situation of the basic territorial units (culture, religion, language, demography, economy, history, environment, …) and to their relative spatial proximity (e.g. constraint of contiguity). Homogeneous regions are different from typologies which do not introduce any constraint of spatial proximity or from continents which are purely based on spatial proximity and not necessary on similarity.

E.1.7.4 FUNCTIONAL REGIONS

Functional regions are defined by an observer which use one or several criteria of effective flows or potential flows (accessibility) which can be of very different type (people, money, information, goods, …) and measure in different ways. Functional regions are not necessary associated to precise limits and can be organised by gradients (influence area) or by specific networks.

E.1.7.5 MENTAL REGION

Mental regions are defined by observers which use subjective criteria based on individual o collective representations. A typical example of mental regions is the division of the World in « Continents » (see above) which do not fulfil any objective criteria but are nevertheless very meaningful issue for the comprehension of the World. The fact that mental regions are based on subjective criteria does not mean that it is impossible to produce objective measures of these collective representations (Cf. WP 8.6: survey on the Weltanshauung of ESPON community)

E.1.7.6 HISTORICAL PERSPECTIVE

Each type of regions has potential influence on the other types in an historical perspective …

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POLITICAL          ───────►      HOMOGENEOUS
REGIONS            ◄───────      REGIONS


FUNCTIONAL         ───────►      MENTAL
REGIONS            ◄───────      REGIONS
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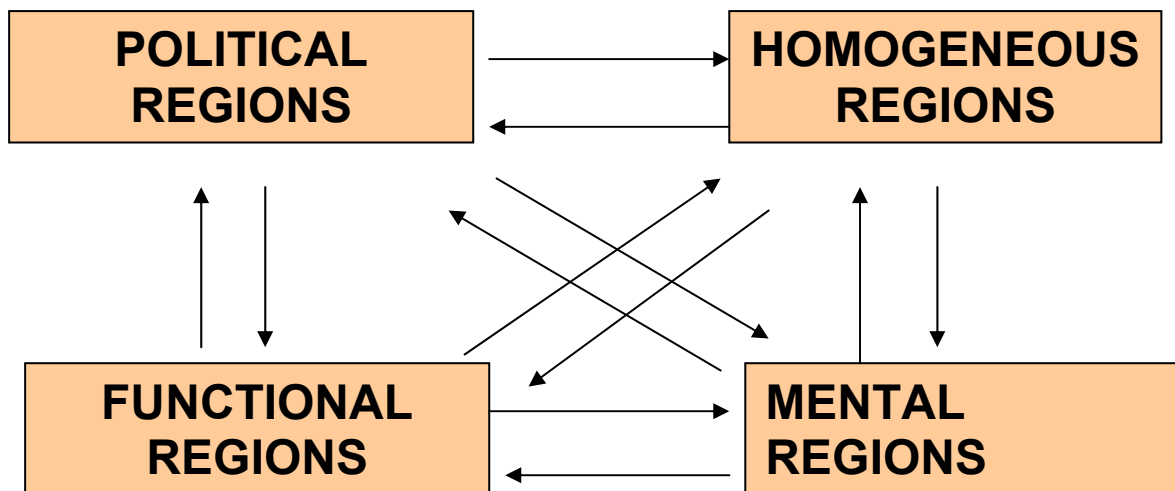
We did not decide yet what will be the presentation of our various proposals of World regions. Will we introduce a hierarchy of level? Will we propose a best solution? Those questions still have to be discussed in the core team responsible of the key question.

E.2   KEY QUESTION 2: EUROPE IN ITS NETWORKS

N. Cattan, M. Johansson, P. Medina, D. Rauhut & C. Vandermotten

Introduction

The Key question 2 "Europe in its networks" will focus on the analysis of networks, flows and cities that connect Europe to the rest of the world. Europe in its networks is a trans-scale approach, which does not introduce an assumption of contiguity (continuous territoriality) but an assumption of connexity (discontinuous territoriality). Its main objective is to illustrate how networks and flows shape the way that society relates to space in order to better highlight and understand the reorganization of world space and of European territorial structures. Three types of exchanges are taken into account. Each one corresponds to a strong dimension of globalization and provides an original image of the insertion of Europe in the world networks. Their comparison and combination will make it possible to give relevant and comprehensive indications on the various forms of territorial integration at different geographical scales.

The position of Europe in the world network will be first analysed through the international air flows that occur, in particular, between the cities (E.2.1). Second, the role of Europe in the world networks will be studied through trade flows and foreign direct investments flows (E.2.2.). Third, we will analyse the way Europe have experienced the international migratory flows during the last twenty years.

E.2.1 EUROPE IN AIR FLOW NETWORKS

E.2.1.1 MAIN OBJECTIVES

Europe in air flows networks gives a huge avenue to the way the world and the European space is organized vis-à-vis the international air flows that have been observed during the last two decades. Thanks to their relative fast capacity to adjust with supply and demand, the air network are very relevant indicators of globalization and is one of the best synthetic indicator of contemporary societal trends. As such, air flows highlight the way in which current integration processes shape the relations of society to space and reorganise the territorial structures at different scales.

This study examines in particular the linkages between cities. A strong hypothesis is made on the fact that many human activities are not present in all points of a territory but are concentrated in very specific areas strongly connected to each other. We do believe, for example, that the new "frontier" of EU is several international gateways cities and not only some external borders of the EU territory either at its Eastern limits or at its Southern ones. We also accept the common idea that the World metropolitan archipelago is not necessary connected to the states, regions or macro-regions where the metropolitan areas are located.

While repositioning the questionings on Europe in its networks in terms of inter-cities relations, this question differ from the majority of the analysis that are undertaken in this project. Of course, the example of intercity air flows doesn't give a representative picture of how world's networks are globally organized. This approach is proposed to provide a necessary counterweight to the dominant visions and perceptions of the researches on the world networks and world cities dynamics. Indeed, from the one hand, the description of

world flows leads many researchers to define, between countries or between several regional blocs, the main roads of the international exchange. From the other hand, the great majority of existing researches in this area seeks to produce knowledge on the cities themselves, to evaluate their strengths and weaknesses, and to estimate their growth rates. Consequently, this means that a large majority of studies constantly produced and reproduced urban typologies. Peter Taylor (2002) denounce the paradox of researches on the world cities in the following way : whereas the essence of world cities is their relations to each other, studies continue focusing on case studies and comparative studies evaluating patterns within cities and neglecting ipso facto intercity relations. This study aims to go beyond these too static images of the world that reduces it to a hierarchy of poles where the only wealth production processes are taken into account. It will help going beyond certain "narrow" and partial visions of the spatial organization of the world.

Map 14 : Most important international-European air routes in 2000
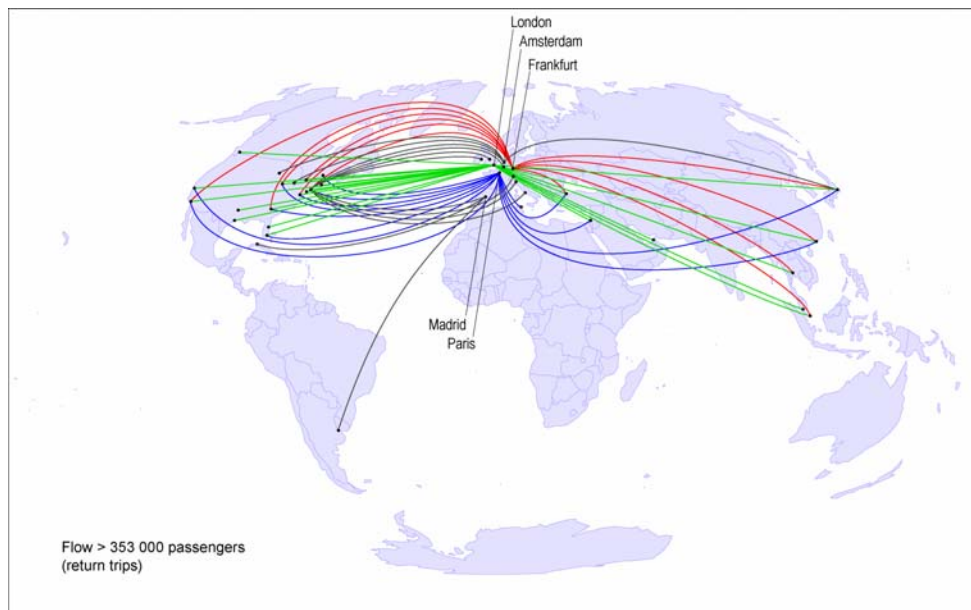
Source : N. Cattan, 2004, *Final report of ESPON 1.1.1*

This work will contribute answering for example the following questions:

"World and Europe spatial organization"
- What are the main privileged linkages at the World, European, and meso-regional levels?
- How several territorial inequalities within the European space are related to the flows that link Europe to the rest of the world?

"European gateways"
- Where do the processes of internationalization occur in the world system?
- What are the main European gateways for air traffic?

"Global cities, World Networks"
- How could we define the "world metropolitan archipelago"? Is it a reality?
- How European cities are connected to this global city network?

All these analyses should enable us to answer the way Europe perform in the World system of air exchanges mainly whether the world air network draw a polycentric image of the world

networking system. This work will include qualitative commentary noting that the fastest increase in emissions in Europe is now from the transport sector, and that environmental organisations are calling for Emission Trading Systems to be applied to aviation. Thus a sustainable development discussion will be added to the analysis.

E.2.1.2 Mains expected results

We have already highlighted in a previous ESPON study – polycentrism, 1.1.1- the models of the European territorial integration through air traffic.

The first European urban network pattern of integration through air traffic is that of the *"North-Western" capitals,* which can be termed, *integrated polycentrism*. Capitals can be political, such as Paris and London, or economic such as Frankfurt.

The second pattern concerns the networks that link the Southern, Western and Northern capitals to the North-Western ones (for example: Madrid to London and Paris, or Stockholm to London) as well as the flows that link the "peripheral" capitals to each others (such as the flows between Lisbon, Madrid, Barcelona, Roma, Athens on the one hand and Stockholm, Oslo, Copenhagen, Helsinki on the other). This networking pattern can be qualified as emerging polycentrism. The two previous models combine and provide a type of integration that we can call *Metropolitan polycentrism.*

The third pattern of urban networking through air traffic corresponds to the exchanges that link the cities from new accessing countries to established EU cities. These connections are done according to a model of integration that corresponds to the concept of *monocentric integration in a polycentric system*. What is interesting here is that some accession cities connect directly to the central capitals, while others first connect to the closest EU capital, drawing a regional model of integration (as for example the Baltic cities towards Stockholm).

Consequently, we have to underline that various types of integration are occurring across Europe. One cannot understand the processes of territorial integration without taking into account the complexity of each of these various types.

We do believe that it is a very challenging issue to carry out a similar approach at the World level.
Referring to the Terms of references of the tender, Europe in its networks will give a detailed attention to the various levels which organize the flows i.e. worldwide networks, Europe networks with the rest of the world, and networks between Europe and its neighbours. It will focus in particular on policy recommendations that sustain the emergence and consolidation of a polycentric Europe in a polycentric world. In consequence, the recommendations will be made towards strategies and arguments that help spatial planners developing and taking decision on the best way to implement, in various territorial contexts, networking and cooperation between urban areas. Three main avenues are given below
   o   Does a city have to specialise its traffics (mono-direction, multi-oriented, mono-types, multi-category….) in order to constitute privileged gateways of Europe?
   o   How a city could perform its linkages on a medium term?
   o   Which model of spatial integration (centre-periphery, metropolitan networks, clusters of cities, multi-oriented polycentrism….) must be privileged in the long term in order to create a better European territorial dynamics which supports social and territorial cohesion?

Figure 33 : Models of European urban network integration through air traffic
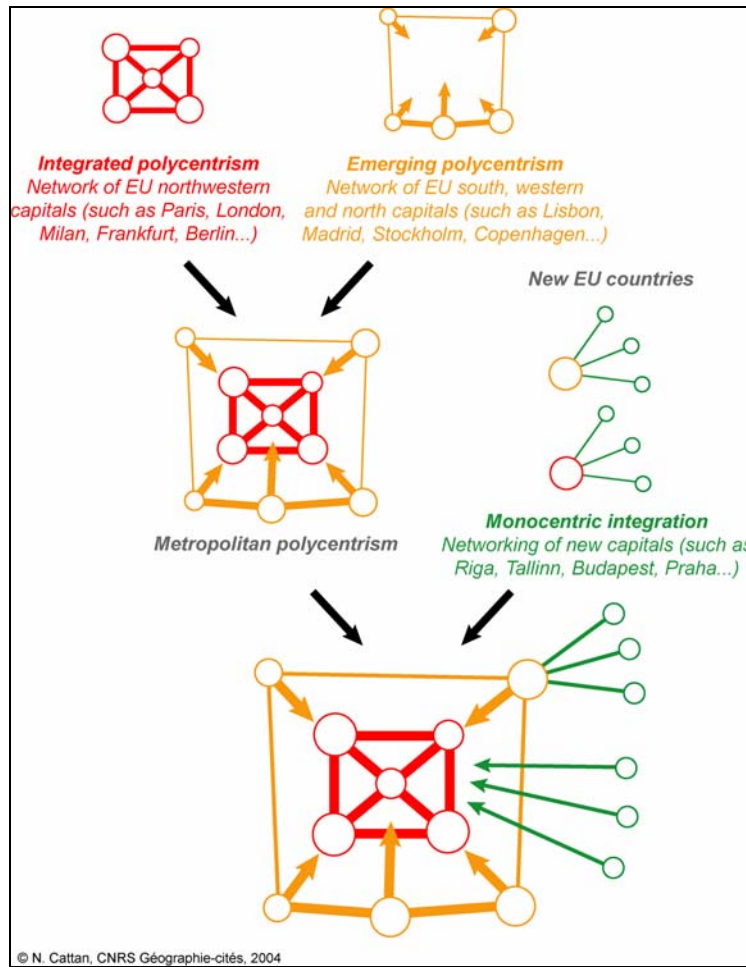
E.2.2 EUROPE IN WORLD AND FINANCIAL AND TRADE FLOWS (IGEAT)

E.2.2.1 EUROPE IN THE INTERNATIONAL TRADE FLOWS.

The economic position of Europe in the world and the resulting flows will be examined firstly from the point of view of the international trade of merchandises and services: the flows between Europe, as a whole, and the different parts of the world and their evolution from the end of the last World War shows the central position of our continent as a node in the world economy. Europe is specifically oriented towards Africa, but we have unfortunately to take into account the decreasing part of this continent in the world economy, Eastern Europe and the Middle East. It is also interesting to show the rebalancing of the flows between Europe and North America in favour of Europe. On the contrary, the evolution of the European position with regard to Latin America is more and more contested by North America. This study of the main flows will also emphasize on the specificities of the flows of the different parts of Europe with the different parts of the World.

E.2.2.2 EUROPE IN THE FDI FLOWS.

Another kind of flows which illustrate the position of Europe in the world is the evolution and the directions of the FDI investments in the rest of the world. It will be examined through the direction of the flows, illustrating here also a trendy bettering of the European position towards North America, and through the global position of the European trans-national companies in the world economy.

The European position in the leadership of the world economy, alongside with North America and Japan, and the specificities of the geographical orientations of the European economy are illustrated through the position of the European cities as nodes in the worldwide network of the advanced services. It will be exemplified using the GaWC methodology. This position is also reflected in the position and the connectivity of the main European cities in the worldwide airflows.

The geographical specificities of the commercial and economic links of the different parts of the EU with the rest of the world are for a part the result of historic and cultural traditions. Those traditions are also one of the reasons of the peculiarities of the migration flows from the rest of the world to the European countries.

E.2.3 WORLD MIGRATION TRENDS (ITPS)

International migration is part of a trans-national revolution, which is reshaping societies and politics around the globe. Over the last decades four major areas of immigration have emerged: North America, Australia, Western Europe and the Arab oil countries.

Historically, countries like USA, Canada, Australia, New Zealand and Argentina have been the target for large scale immigration. During the last 20 years USA, Canada and Australia have experienced new large scale immigration, particularly from Asia and Latin America. Northern and Western Europe experienced a large scale labour migration between 1945 and

1970. Today this area attracts mainly immigrants from Africa, Asia, Latin America and the Caribbean Islands. The oil-rich Gulf countries, particularly Saudi Arabia and Kuwait, have become major magnets to immigrants from the Arab world, Africa and Asia since the sharply increasing oil prices in the 1970's.

The table below illustrates to some degree the description above but is focused on the turn of the century and prognosis for the ongoing decade. North America is still the dominant receiver of migrants in relation to the population size and Latin America is the dominant emigration region. Even if the data hide the destination and origin of the migratory movements it seems obvious that the flows still – besides war and catastrophes that cause forced or impelled migration - are dependent on the economic situation in the regions of origin and destination. The flows are asymmetrical in the sense that the areas of origin mostly are included in the less and even the least developed parts of the world and the destination seems often to be the more developed regions. It is perhaps not only a qualified guess that many of the emigrants from Latin America are people from Central America with destination Northern America and that many of the African migrants are leaving for Europe. The Asians are moving both moving to Northern America and Oceania (people from the eastern part of Asia) and to Europe (people from the western part). The latter seems to have been increased during the last decades as a consequence of wars and social conflicts.

With regard to Europe, the "population crisis" and the potential labour shortage in the future can not be solved by "replacement migration". The migratory movements need to be so large that it is not realistic to discuss this as a way out of the European "population crisis" or a way to get rid of future labour shortage.

Table 13 : Net-migration rate 1995-2010 (per mille) with regard to different world regions. Prognosis, medium variant. Source. UN, World Population Prospects, 2004 Revision Population Database.

	Europe	North America	Oceania	Latin America	Asia	Africa
1995-2000	1.5	4.5	3.0	-1.7	-0.4	-0.4
2000-2005 est	1.5	4.2	3.2	-1.5	-0.3	-0.5
2005-2010 est	1.1	4.0	2.7	-1.2	-0.3	-0.4

When comparing the global migratory movements, four general tendencies can be identified, which are likely to play a major role in the coming 20 years:
- *Globalisation of migration*: the tendency is that more and more countries get affected by the migratory movements. The immigrants come from countries farther away from the host country and the immigration countries host entrants from a broad spectrum of cultural, economic and social backgrounds.
- *Acceleration of migration*: migrations are growing so rapidly in volume in all major regions at present, which increases the urgency and difficulties for government policies.
- *Differentiation of migration*: most countries do not have one type of immigration – e.g. labour immigration, refugee immigration, family reunion immigration, student exchange programmes or permanent settlements – but a whole range of them. This differentiation presents a major obstacle to national and international policy measures.
- *Feminisation of migration*: historically labour migration and refugee migration was dominated by males, and family reunion migration by females. Since the 1960's this has begun to change. Today women constitute a majority of the world labour migrants and the share of women amongst the refugee migrants is increasing.

E.3 KEY QUESTION 3: "NEIGHBOURHOOD"

The neighbourhoods of Europe are a quite recent preoccupation and an unknown area. Of course the list of the Mediterranean associated countries (Barcelona process) is well known, so are the Eastern countries concerned by the European Neighbouring policy, but this does not mean a clear understanding of this large Euromediterranean[17] territory, neither of the interactions between neighbouring countries and UE territory.

E.3.1 A STRONG NEED FOR A COMPREHENSIVE REPRESENTATION OF THE EUROPE'S SURROUNDING AREA

Up till the beginning of the 2000 decade and the definition of what could be a European neighbouring policy ("ENP"), one can say that there was no clear representation of the countries which are surrounding UE. The prominent idea was, on the Eastern side, the increasing divide between PECO and former USSR, and on the Southern side the divide between European civilization and arabo-islamic civilization. The European debates were focused on the geographic future enlargement of the UE: should it encompass all PECO, Bulgaria, even Turkey? Minds and maps would not go further this "no European's land".

The announcement of an ENP in March 2003 was a significant step. For the first time a distinction was made between the *institutional* dimension of Europe ("UE"), and its regional influence area i.e. its *functional* dimension. Nevertheless, many uncertainties remain. Uncertainty in the neighbourhoods delimitation, once more: the ENP does not cover countries that are candidates for EU membership i.e. Bulgaria, Romania, Turkey nor Croatia ; the EU Association Agreements with Egypt and Lebanon (up to now not fully integrated into the ENP) have been put into force very recently ; the EU currently has no contractual relations with Libya which means that this country is not (yet) even included in the Barcelona process, not speaking of ENP, whereas he Council endorsed since 2004 the inclusion of Armenia, Azerbaijan and Georgia in the ENP, and defined a "strategic partnership" with Russia since 2003.

Uncertainty in goals and strategy. In particular, what should be the status of this EN policy compared to European general foreign policy? Does UE has to consider that its neighbouring countries are and should be more important economic partners than, say, remote Asia, Northern America or Latin America? If so, should eastern neighbours on the one hand and southern on the other have the same status?

Uncertainty in instruments and means. The 2003 announcement entailed the idea of a new financial instrument ("new European Neighbourhood and Partnership Instrument") that should be defined for the 2007-2013 term. The Commission has proposed to almost double its assistance to €15 billion for 2007-2013 as compared to €8.5 billion for 2000-2006 under respective predecessor programmes (Tacis and Meda), but nobody has today the slightest idea on what will be the real amount.

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[17] "Euro" including here up to Russian and Caucasian areas

Uncertainty, finally, in the impacts of the ENP. First in terms of economics: what gain in markets (given the 2010-FTA project) for European firms, and in new labour forces (given the European forthcoming shortage)? How will Europe compete with nowadays explicit US challenging for the leadership on Russia and Arabic areas influence? Secondly, what impact in terms of environment, given the interactions between both sides of Mediterranean Sea or Black Sea. Thirdly, in terms of cultural exchanges and political stability. Last but not least, in terms of territory: what would be the impact of the ENP on UE peripheral regions and bordering cities such as Marseilles, Seville, Athens, Warsaw, Budapest or Tallinn? How high could get the sub-regional integration, how dynamic the Baltic Sea Council or the Black Sea Economic Cooperation, or the Barcelona process or even the – quasi departed – Arab Maghreb Union to enlarge "Euro-regions" and enhance cross-border cooperation?

In a word, it is hard to have a comprehensive view of the surrounding area of Europe, either on strategic and geographic sides.

E.3.2 THE WORK PROGRAM ON EUROPEAN NEIGHBOURHOODS

We first have to determine a cartographic frame. Our last Paris meeting was helpful and led to a decision: the frame would entail Caspian Sea (East) and Sahelian area (South) in order to draw a significant picture of close neighbourhoods by contrast with further territories.

Then we have to draw a precise picture of the current socio-demographic, economic and environmental situation of these neighbourhoods, in order to show:
- The great variety of situations among southern neighbours
- The north-south *convergence* in the long run (infantile mortality, fertility rate,…)
- The depth of problems and threats on the eastern side (Ukrainian, Moldavian or Romanian's economic failure, nuclear threats in Slovakia, Armenia, Russia, etc).

Then of the potential economic complementarities and win-win partnership: markets (size and growth of neighbours' economy), investments opportunities (profitability and risks for European investors, FDI needs for neighbours), labour forces demand (European countries) and supply (neighbours especially southern).

Four, we have to measure the level of real integration of this wide Euromediterranean region (see E.3.3). The goal here is to highlight the particularity of the region compared to other Integrated Zones: high tourists flows and air travel, quite high (yet globalizing) migration exchanges, quite high (despite dissymmetric) trade flows; but very low FDI flows, despite the importance of remittances (especially to Morocco, Tunisia, Egypt and Jordan, even if far behind what China, Mexico, India, Philippines or Indonesia gain form their out-migrants).

E.3.3 FIRST RESULTS ON TRADE FLOWS WITH NEIGHBOUR COUNTRIES

First results have been obtained in the matter of the level of integration of neighbour countries according to trade flows.

E.3.3.1 Imports and exports to/from EU neighbour countries.

The attraction of EU on the external trade of neighbour countries is obvious. It is possible to make a typology of these countries, according to the importance of their trade oriented to EU. The EU attraction is at its highest level in the countries of several regions : Western part of Northern Africa, a part of East Mediteranean, Balkans. Those countries are small commercial partners (small suppliers and small consumers) but they all make more than half of their exports to EU. This is due not only to geographical proximity and historical relations, but also to a cooperation process in the commercial field, which has been underway since the 1970s (cooperation agreements with Mediterranean countries for example). The attraction of EU on their exports has been recently enhanced, since the 1990, because of the Euromed Association Agreements, in the frame of Barcelona Process, whose commercial outputs (especially with respect to encouragement of free trade) are more obvious than political ones. Before any new enlargement, many countries of EU neighbour are already integrated in what can be called a Euromediterranean commercial zone. For instance, the countries of the Western Balkans make more than 84 % of their external trade with EU

Other regions are less EU oriented for their exports:
−   The Near and Middle East countries export high quantities of petrol to EU but also to Eastern Asia and to Northern America. The attraction of EU on their trade is relatively low. Nevertheless, although EU attract less than 50 % of their exports, it is often their first commercial partner (Lebanon, Syria, Irak, Israel).
−   The case of CIS is a bit different : all the former soviet republics, except for the Baltic states, are still Russia oriented for their external trade. This reveals that the economic relations which were into force during the Soviet period are still going on. While all the countries of Central Europe have dramatically changed the orientation of their trade, from Russia to EU, those of Eastern Europe, Caucasia and Central Asia are still closely linked to Russia. The only exception in CIS is… Russia itself. It absorbs the majority of CIS countries exports but its exportations to EU are dramatically growing since the 1990s, especially since 1998. Since 2004, because of the enlargement of EU, more than half of Russian exports are EU oriented. That means that the integration of CIS countries in the Euromediterranean space is underway, not directly but through Russia. The EU orientation of Russia is largely due to oil and gas exports: because of the high prices of these materials, Russia has been the third supplier of EU, and it is also its fourth consumer in 2004 (4,7% of EU exports).

The outbreak of imports of EU neighbour countries is also largely EU oriented. The role of EU is even clearer than in the previous map in the Gulf countries, Ukraine, Israel, etc. This also due to geographical proximity and agreements, which often contain commercial strands. The map also shows a strong spatial discontinuity between North Africa and other African countries, which are less involved in the globalization process than the formers.

Map 15 : European neighbourhood trade

DESTINATIONS of EXPORTATIONS from EU NEIGHBOURHOOD
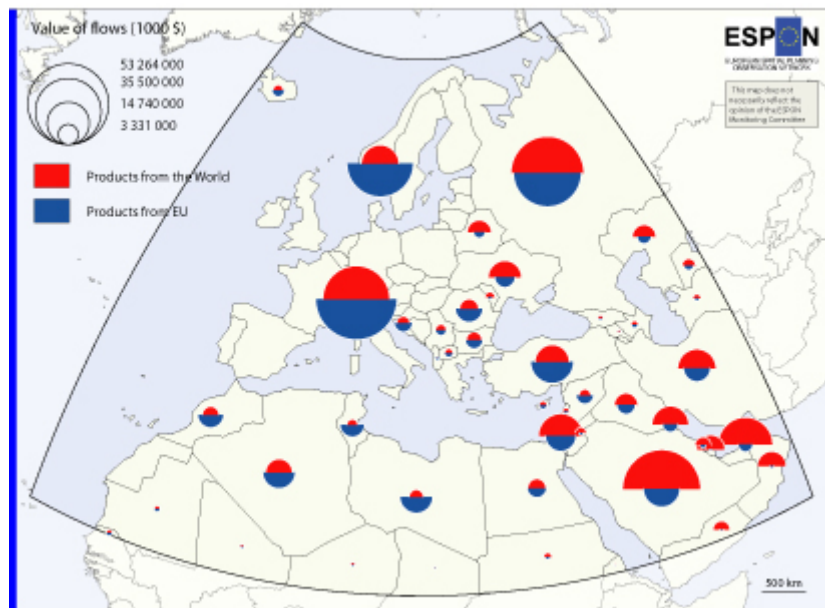
ORIGIN of IMPORTATIONS to EU NEIGHBOURHOOD
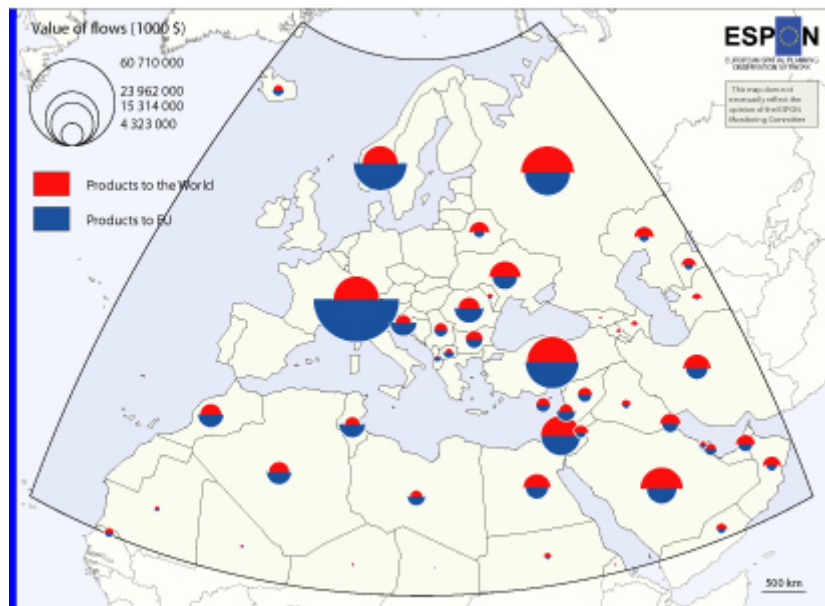
## E.3.3.2 THE EXPORTS AND IMPORTS OF RUSSIA AND TURKEY.

Both of the maps concerning Russia and Turkey confirm the importance of EU as a commercial partner for its neighbour. Because of its enlargement in 2004, EU is now the first destination of Russian exports. The annual average increase of EU – Russia trade in 2000-2004 has reached 10,9 % in value, while the increase of the total EU external trade with the world has reached only a 1,8 % over the same period. This is due to the following factors:

- Exports of oil and gas, in the frame of a Russia-EU energetic dialog: 90 % of exported Russian gaz is going to EU for example. Several EU members are totally dependant to Russia for their energetic supplies (new member states, Finland, Germany, etc.). This dependency is likely to increase because of the decline of oil and gas reserves in Western Europe. Actually, the Russian external trade consists in exports of raw materials – thanks to enormous reserves - and imports of manufactured goods.
- Future enlargements of EU to former socialist countries such as Romania and Bulgaria, closely linked to Russia.
- Implementation and deepening of Partnership and Cooperation Agreement between Russia and EU : several common spaces will be brought into force in the next years. Its membership to WTO will certainly increase its external trade.

As far as Turkey is concerned, the map shows a high level of commercial integration with EU, whereas one could have expected a very much USA oriented trade (because of Turkey membership in NATO). The annual average increase of EU – Turkey trade in 2000-2004 has reached 9 % in value, while the increase of the total EU external trade with the world has reached only a 1,8 % over the same period. This is due to its geographical proximity, to the implementation of a Cooperation Agreement signed with EU in the 1970s, recently replaced by an Association Agreement and the integration of Turkey in the European Common Market in 1996, and to Turkish economical specialization that fits to EU ones. The importance of EU is more obvious on Turkish exports than on its imports, which is to a certain extent a sign of economical dependency of Turkey. The relations with the Balkan countries are increasing since the end of 1990s, but Turkey's trade flows are more directly oriented to EU centres such as Germany, UK, France and Italy.

Map 16 : Russian Trade

ORIGIN of RUSSIAN IMPORTS
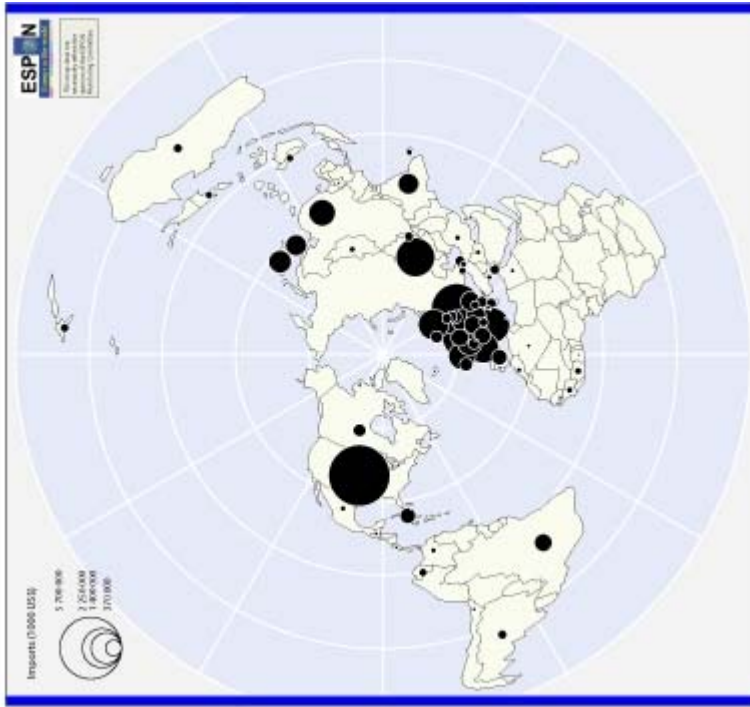
DESTINATION of RUSSIAN EXPORTS

Map 17 : Turkish Trade :

ORIGIN of TURKISH IMPORTS

DESTINATION of TURKISH EXPORTS
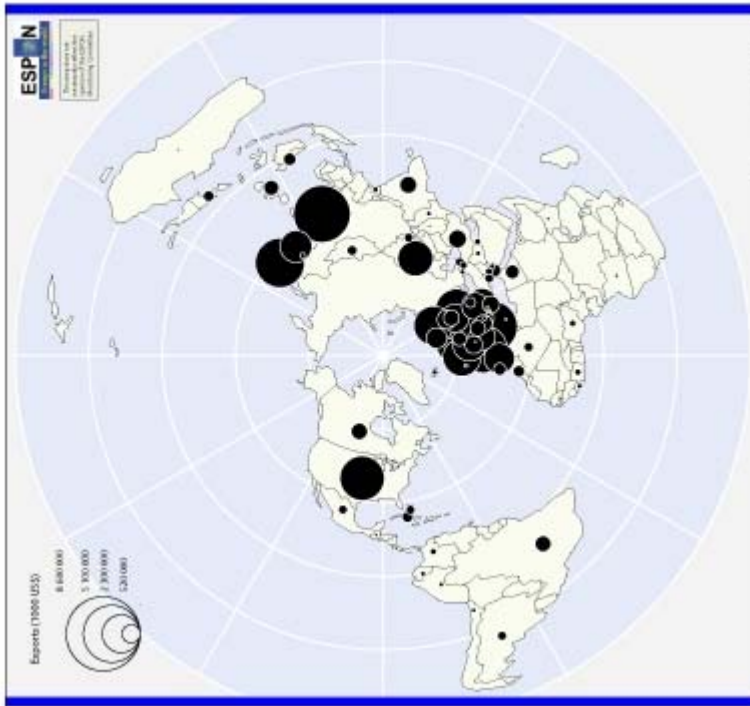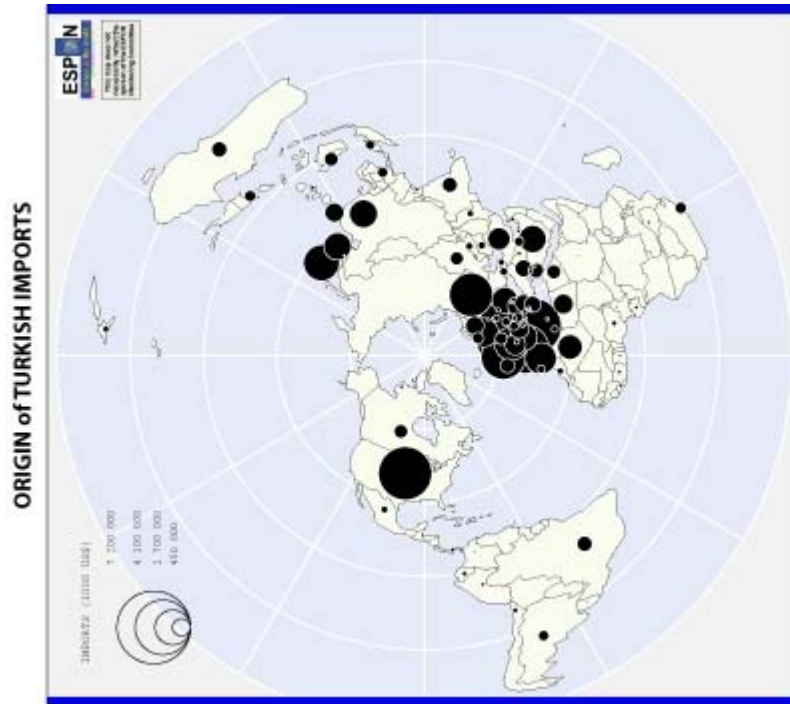
E.3.4 QUESTIONS FOR FURTHER POLICY RECOMMENDATIONS

Compared to wide range global flows ("archipelago" pattern: domination of multi-directional urban region-to-urban region links involving many European cities with no clear neighbouring impacts) and compared to strong connexions between Europe and the other regions of the Triad, this Euromediterreanean regional view might be increasingly relevant. In any case, we have (i) to confirm or invalidate the relevance of such an "European Region"; (ii) check if it fits with the official European Neighbouring Policy delimitation, and see the consequences on Interreg policy; (iii) suggest new instruments for immigration policy and namely short-term flexible migrations; (iv) figure out what could be an integrated Mediterranean policy for training, research ("knowledge economy") and skill immigration in order to reduce European labour forces shortage *and* avoid southern brain drain, (v) promote a sub-regional cooperation between PECO and Russia.

E.4 KEY QUESTION 4: ANALYSIS OF THE INTERNAL DIFFERENTIATION OF THE EUROPEAN TERRITORY ACCORDING TO GLOBALISATION

P. Medina, C. Vandermotten

The geography of the European territories (EU29, Switzerland and Norway) in relation with the globalisation processes has to be defined from two different points of view.

E.4.1 LINKS OF EUROPEAN REGION WITH THE REST OF THE WORLD

The first, the external one, has to define the place of Europe as a whole, but also the European regions versus the rest of the world. Thus, we have to take as much as possible into account the specific geographical patterns of the links, relations, competitions of the different parts of Europe with the rest of the world. On a provisional basis, we could consider here that the specificity of the geographical orientations of Europe and the European regions within the globalisation processes could be defined in relation to the following main geographical entities (this subdivision aiming at putting into evidence the potential political consequences of specific orientations of the EU-members States) :

- **Triad countries** (possibly further divided between North America; Japan, South Korea and Taiwan ; Australia - New-Zeeland) ;
- **Periphery and semi-periphery**, of which :
- Non EU-Balkanic countries ;
- Eastern Europe and Russia, including Caucasus and Central Asian former USSR countries ;
- North Africa ;
- Turkey ;
- Middle East ;
- South and South-East Asia ;
- China ;
- Africa (outside North and South Africa) ;
- South Africa ;
- Latin America.

These links will be studied on the basis of at least the following indicators:

- foreign direct investment
- trade
- air flows
- tourist flows

Most of these indicators are only available on national level, however, and so we will attempt to infer their values for lower NUTS-levels through proxy indicators, such as employment.

Moreover, it seems necessary to define, in the framework of the globalization processes, the nature of the links between the regions of the old and the new members states of the European Union, but also to take into consideration some dramatic developments in some countries like Ireland and eventually Portugal.

E.4.2 IMPACTS OF GLOBALISATION ON EUROPEAN REGIONS

The second one, internal, takes into consideration more in depth the impacts of those links and processes on the European regions. As an hypothesis, we define *a priori* some types of regions, each type representing a different regional response to globalisation. These responses are obviously influenced by many different factors, and this typology presents a simplified view of these influences. The use of some key indicators (see table below) will have to confirm these hypotheses, and possibly modify this typology. In a second step, the results will be confronted to the existing ESPON typologies, to examine how they fit and if they are pertinent or not regarding this matter.

On the basis of this typology (if confirmed) and other relevant ESPON typologies we will elaborate maps (analytical or synthetic/schematic) corresponding to the different themes covered in WP2 and if possible a global cross-thematic map.

The basic regional hypothesis can be summarized as follow :

3) **(Global) world metropolitan regions** : it concerns mainly the London and Paris global cities, but also some main more or less polycentric metropolitan regions, like Randstad Holland, Rhine-Ruhr or Rhine-Main, main cities like Milan or Madrid, and Brussels metropolitan region, due to the specific functions of this last city in the European political field. Those regions should theoretically benefit from the globalization processes, as they are the key nodes of the world-wide networks, hosting the headquarters or at least the continental headquarters of the main multinational firms. Very often, the main locations for the innovation processes and research and development are located inside those metropolitan regions. They are also the main focuses of the cultural globalization processes. The analysis will show some specific geographical orientations for each of those main metropolitan regions, and argue about their consequences : London seems to be more world-wide oriented, Paris more European-oriented; Madrid develops special links with Latin America; etc.

   However, if those metropolitan regions seem to benefit globally from the globalization processes, we also have to take into account some negative trends which can affect them internally : growing dualization between qualified and unqualified people and between affluent (central gentrified or periurban) and deprived areas; de-industrialisation processes due to a global dispersion of activities (mostly towards low-cost countries); etc.

6. **Intra-EU relay or second-level metropolitan regions** : these second-level metropolitan regions should also benefit from the globalization processes, as nodes of the intra-European networks, even if they are generally not the location of the main headquarters. Some Central-Eastern European capitals, like Warsaw, Prague, Budapest have a special position, as they host the relays of the Western European advanced services firms in the new member states. Here also, it will be interesting to examine some geographical specificities of the links, as well as for the main relay-cities in the old member states (for instance Berlin *vs*. Vienna). However, it will be necessary to examine more in depth the case of cities which are less benefiting of the processes and identify the factors of poor performance: early industrial metropolitan regions, lack of strong urban renovation processes (thus less attractive), etc.

4. **Central regions theoretically benefiting from the globalisation processes** : some parts of the central European regions, outside the metropolitan regions, could benefit from the globalisation processes. The conditions therefore are supposed to be good environmental conditions, economies strongly supported by research and development, medium-size cities with strong cultural, scientific or touristic potential, etc.

i. **Central regions endangered by the globalisation** : on the contrary, some other parts of the central European regions could suffer from the globalization processes. For a long time, this has been the case of the heavy early metallurgical and coal-mining regions, competing first with the maritimisation processes inside the EU, but now with the production of the rest of the world; it is beginning to be the case for some fordist regions, for instance regions where car or electric domestic appliance industries were developed during the Sixties, now competing with Central-Eastern European or Asian countries; finally, it could be the case of the small and medium enterprises manufacturing Marshallian districts: those districts were very dynamic during the last decades, but the question is if they will be able to maintain this situation in the future, as they will be more and more in competition with low-wages countries and, in addition, are often quite weakly involved in R&D.

ii. **Peripheral or semi-peripheral regions benefiting from the globalisation (generally without regional power of decision)** : the study will examine different cases. The kinds of regions which could benefit from the globalisation processes are supposed to be specific technopolises in agreeable environmental locations, like Toulouse (but that concern intra-national processes more than trans-national); specific relays for the development of technological industries, like Ireland between the US and the UK; touristic regions, if they are able to develop qualitative products competing with low cost extra-EU destinations; Western parts of the Central-European new member states, hosting delocalised or local more or less "maquiladoras" industries; etc.

iii. **Intra-EU disconnected or losing peripheries (with a distinction between those with a quite high level of income due to transfer resources and those with a quite low level of income and/or in a situation of significant recession)** : Here we will have to examine different situations. In some case the difficulties linked to the peripheral situation are not really related to the globalisation processes we are examining here. It is the case for the Scandinavian Far North (for regions with high personal income) or the more rural isolated parts of Central-Eastern European countries (for regions with low personal income). But in other cases, peripheral regions could lose from the globalization processes : it could be the case for low-cost low-technological manufacturing regions, like the North of Portugal, or for some touristic regions submitted to the competition of new destinations in the world.

The examination of the consistency of these hypotheses implies a characterization of the regions, at least at the NUTS 1 or 2 levels, sometimes with more punctual indicators. The following is a first list of indicators that we will study, to be completed with the results of the thematic research conducted in the context of WP2.

Topics and sub-topics or indicators for the sub-topics	Scale of the analysis	Taking into account of the geographical specificities of the links with the rest of the world
Insertion in the international networks of command, control and production of the information	Big metropolises	
Direction of the world-economy : location of the headquarters of the main world companies and evolution of their relative position during the last twenty years		No
Relay and interface position in the world-economy : - Position in the networks of the advanced services firms (GaWC research)		Specificity of the intra- or extra European orientation
- Position as congress cities		No
International accessibility (by air)		Intra-European specificity and towards the main subregions of the world

Topics and sub-topics or indicators for the sub-topics	Scale of the analysis	Taking into account of the geographical specificities of the links with the rest of the world
Commercial insertion		
Percentage of extra-UE imports in the external trade of merchandises	States (if it is not possible to do the study at a lower level)	Yes
Percentage of extra-UE exports in the external trade of merchandises	Idem	Yes
Percentage of new member States in the intra-UE trade of merchandises	Idem	No
Evolution of the percentage of new member States in the intra-EU trade of merchandises during the last decade	Idem	No
Percentage of low technology products in the export of merchandises	Idem	No
Percentage of services in the export of services and merchandises	Idem	No
Volume of traffic of merchandises at the outer crossing-border points of the EU and in the ports	Punctual	Yes

Topics and sub-topics or indicators for the sub-topics	Scale of the analysis	Taking into account of the geographical specificities of the links with the rest of the world
Investment opportunities and vulnerability towards delocalisation	Nuts 1 or 2	
Volume of the FDI and percentage in the local economy		At least distinguish between Triad (outside EU) and old members States of the EU
Percentage of the low technology sectors in the manufacturing product (EUROSTAT/IGEAT statistics of the regional product)		Without object
Percentage of the market services in the regional product (idem)		Without object
R-D value as a percentage of the regional product	At the level of the States if not possible at the NUTS 1 or 2 level	Without object
Netto productivity of the manpower (cost of the manpower by unit of added value)	At the level of the States if not possible at the NUTS 1 or 2 level	Without object

Topics and sub-topics or indicators for the sub-topics	Scale of the analysis	Taking into account of the geographical specificities of the links with the rest of the world
Migratory opportunities and pressures	Nuts 1 ou 2	
Part of the external migratory balance in the evolution of the population during the last decade		If possible
Percentage of foreigners in the population		Yes

Topics and sub-topics or indicators for the sub-topics	Scale of the analysis	Taking into account of the geographical specificities of the links with the rest of the world
Insertion in the main infrastructure projects and environmental matters Main intra-European infrastructural projects which could basically modify the conditions of the global insertion Main entirely or partially extra-European infrastructural projects which could basically modify the conditions of the global insertion Main environmental challenges and cooperation programs with countries outside the EU	Punctual	Without object

F FIRST IDEAS TOWARD POLICY RECOMMENDATIONS

Pierre Beckouche (LADYSS), Claude Grasland (Géographie-cités)

The elaboration of a methodology for the elaboration of policy recommendations is an important output of this FIR of project Europe in the World. As explained in our answer to the tender, we propose to derive policy recommendations from the results of the discussion on the four key questions presented in previous sections and it is only when we have made sufficient progress on the clarification of these key-questions that we will be in situation to propose relevant policy recommendations or – the terms seems better – policy orientations to the ESPON monitoring committee.

In this first interim report, we will therefore limit our ambition to the presentation of general principles to be followed for the elaboration of policy recommendations (E.1) and illustrate these general principles with the example of policy orientations related to neighbourhood policy (E.2).

F.1 GENERAL PRINCIPLES

The general principles to be followed for the elaboration of policy orientations will focus on the specificity of the contribution of the project Europe in the World in the general framework of the ESPON program : the introduction of a 4th dimension which has been presented in the part B of the present report.

F.1.1 INFORMATION AND ACTION

In systemic terms, we can consider the ESPON Coordination Unit and the ESPON Monitoring Comity as a "black box" which receive scientific inputs (the study realised by the ESPON TPG) and produce political output (the proposals for political action transmitted by ESPON to the rest of the Commission and to national authorities). ESPON MC and ESPON CU insure the regulation of the system by controlling the inputs (decision on research to be launched) and the output (decision on the validation of political results). But this system is characterised by a loop of regulation where the analysis of output can produce feed backs to the choice of new inputs to be elaborated.

The decision taken in 2004 to launch a project on Europe in the World is a typical example of such a feed back between input and outputs. At the beginning of the ESPON program, this project was not introduced as the aim of the ESPON project was to develop the principles of ESDP (Economic competitiveness, Social Cohesion, Sustainable Development) on a geographical area limited to 29 states of Europe. It is only because some problems could not be solved in this geographical area that the decision was taken to enlarge the geographical focus. For example, when project 1.1.4 on demography revealed that demographic dynamic of Europe could not be analysed without consideration of external migrations. Or when project 1.1.1. on polycentrism demonstrated that the identification of European gateway cities was necessary related not only to the analysis of flows between European cities and the rest of the world (New-York/London) but also to the relation between cities located out of Europe (Los Angeles / Tokyo).

At first glance, it can seems curious that this interest for the global scale of the World appeared in a research program which should normally focus on the most local level of political action (regional policy). But this results is logical if we consider that DG Regio and National ministry of spatial planning are probably most able to take into consideration the problem of geographical scale than other sectorial department at national and European levels. DG Relex or DG Trade produce of course an important number of interesting research on the political and economical situation of Europe in the world, but they generally focus on a particular geographical and thematic scale of analysis and are not interested in the regional impact of this analysis which are generally based on global aggregates (EU25/World) or national aggregates. The missing dimension is the *regional level*, which should be understood here both in infranational and supranational meaning.

One of the most important political output of the project ESPON 3.4.1. is the symbolic change introduced by the new cartographic templates proposed in this report for analysis at world scale and pan European scale. The map template proposed by ESPON 3.1. and used in the first rounds of ESPON introduced *de facto* a strong limitation of political analysis and was strongly dependant from a mental map of Europe which is deeply grounded in many usual representations of Europe like the map presented in euro currency (see **Erreur ! Source du renvoi introuvable.**).

Figure 34 : Comparison of the spatial framework of ESPON 29 and symbolic picture on euro currency
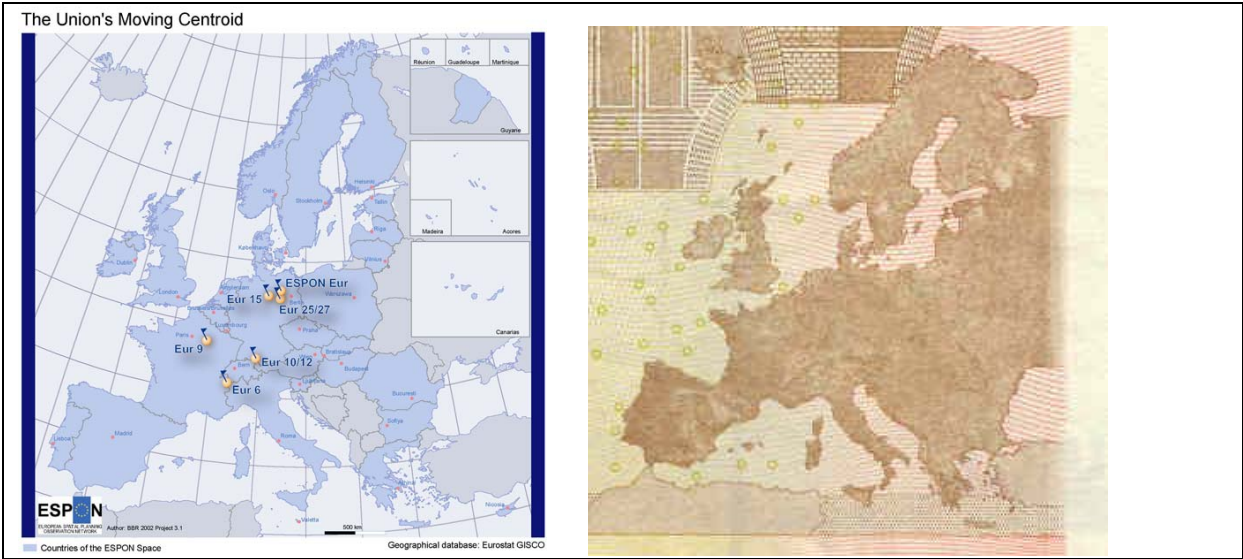
F.1.2 POLICY RECOMMENDATION AND GEOGRAPHICAL SCALE

Each political decision has consequence at different geographical scales and each political level is able to develop different political actions. The problem is therefore (1) to examine how political decisions taken at European scale can produce effects and are subject to constraints at upper/lower political levels, and (2) to define in which cases the European scale is the most relevant for one type of political action. The ESPON program has yet examined many situations of contradictions of scale under the level of Europe (national, transnational, regional, local) and the specific role of project ESPON 3.4.1 is to examine the contradiction of scales which can take place below the European level (pan-european, global).

The elaboration of policy orientation in project ESPON 3.4.1 should therefore start from the political principles of European Spatial Planning (ESDP) or from the general principles of

European Union (Constitution, Lisbon Strategy) and examine precisely if they could be really fulfil in the framework of Europe or could be better realised at an upper level like pan-european or wolrd scale. It is in a sense a transposition of the principle of "subsidiarity" at World/European Scales instead of European/national scales. To illustrate this question we can examine how they fit to the three main principles of ESDP.

- *Economic competitiveness (and Lisbon Strategy)* are typically European policies which imply a global dimension as their aim is to insure that Europe will become the most innovative and competitive economy in the world. This implies the delimitation of world regions in order to propose relevant benchmarking of Europe with other regions of the world. Such benchmarking is generally based on the comparison between areas defined on the basis of economic treaties (e.g. NAFTA / EU25), but one can ask if other delimitations could be proposed for such benchmarking (like pan-European area / northern and southern Americas). The change of geographical scale of benchmarking can induce new political proposals like the idea of a "Marshall plan" for neighbouring countries of EU.
- *Social cohesion (and social Agenda)* are typically policies which are actually lowly developed at European scale and remain rather developed at national scale. For such question the contribution of project ESPON 3.4.1 could focus on the connexion between local and global levels, especially in the case on immigration and integration from workers from foreign countries. During the XXth century, each European country has developed specific policy of immigration and specific links (France/Maghreb, Germany/Turkey, UK/Asia, …) but actually the integrating European Union implies an integration of immigration policies.
- *Sustainable development (and Gothenburg Strategy)* are typically global policies (Kyoto's protocol, Millenium objectives) which have to be implemented at European and national level, as discussed in conclusion of part B. The difficulty of such policies is that they have to be coordinated at world scale and that Europe can not decide of an action without partnership with other parts of the World.

F.1.3 POLICY RECOMMENDATION AND TIME SCALE

As explained in part B., the time scale used in the project ESPON 3.4.1 is not the same than for other ESPON project, except ESPON 3.2 (Scenarios). The fact to base the analysis on time periods from 10 to 50 years introduces important changes in the elaboration of policy recommendations, whatever the topic to be analysed.

If we consider for example the problem of "brain drain" and migration of high skilled workers, Europe is in an intermediate situation of emigration towards United States of America and immigration from less developed countries of southern and eastern peripheries. The future development of research and development in Europe implies either a limitation of emigration flows (by an increase of the budget of research and development), either a development of immigrations flows (by an increase of aids to the development of universities and research centers in neighbouring countries or an enlargement of cooperation programs between university of Europe and less developed countries). The first option is typically a short term policy with immediate feed-backs in a delay of 2-10 years, whereas the second option is a medium or long term policy with potential feed backs which can not be expected before 5 to 20 years. One can estimate that the effects of the second strategy are potentially more important than the effects of the first one, but this policy is most difficult to accept from political point of view because its effects are not immediate and allocate funds outside and not inside the European territory.

F.1.3.1 POLICY RECOMMENDATION AND CROSS-SECTORIAL ANALYSIS

The analysis of the situation of Europe in the World from geographical point of view implies the elaboration of global political strategies which combine different sectorial dimensions : demography, economy, environment, social development, transport, human rights, … This cross-sectorial approach is the most challenging difficulty of the research proposed in ESPON 3.4.1 because it is always much more easy to propose an analytical view which focus on a single sector, a single type of flows.

For example, the study of United Nations on replacement migrations has demonstrated that Europe needs an important flows on immigration during the forthcoming 20 years in order to limit the reduction of active population and the dependency ratio. But such an analysis limits the analysis to a single political objective (labour market) and a single type of flows (migration of people) without considering that immigration is also related to other political objectives (cultural diversity, political influence, social integration of minorities) with contradictory or complementary effects. In the well known example of migration of Indian specialists from computer science to Silicon Valley, one can observe that the initial limited objective of research of high skilled workers has produced many indirect effects like intensification of trade exchanges between USA and India and relocation of subcontractors of Silicon Valley in technological part from Bangalore or Hyderabad.

F.2 THE EXAMPLE OF NEIGHBOURHOOD POLICY RECOMMENDATONS

The Neighbourhoods question shows the utmost importance of the concept of (macro) region to understand political stakes and define efficient long term policies. Compared to wide range global flows ("archipelago" pattern: domination of multi-directional urban region-to-urban region links involving many European cities with no clear neighbouring impacts) and compared to strong connexions between Europe and the other regions of the Triad, this Euromediterreanean regional view might be increasingly relevant.

F.2.1 "NORTH-SOUTH REGIONALISM"

Many authors[18] emphasize the ongoing and potential role of the regionalism and especially what they call the "north-south regionalism" in the globalisation. The reasons why are:

(i) profitable locations for multinational firms in the "southern"[19] parts of these large Regions, that allow both low labour costs *and* access to the core rich countries' markets (due to free trade agreements at Regional scale, such as Association Agreements in the Euromed space)

(ii) possible empowerment of southern economies through these MNF settlements or subsidiaries, because of high level of technology and economic schemes (not necessarily a division of labour based on a low tech vs. high tech divide)

(iii) increase of financial, industrial and commercial links between southern and northern countries of the Region, through these corporates networks and exchanges

(iv) general stability, thanks to specific agreements in order to stabilize fragile southern economies (see for instance the UE/Lebanon Association Agreement that allows Lebanon to keep its tariffs for five years and reduce them progressively during seven more years whereas Europe's tariffs are instantaneously cancelled for Lebanese exportations)

(v) potential extension of a common currency in all parts of the Region (discussions on this topic have been underway in South-Eastern Asia for a decade)

(vi) desirable and feasible public policies coordination between southern and northern countries of the Region, such as migrations, transports and Internet hardware, training (with mutual acknowledgement of degrees, see for instance the Licence-Master-Doctorate European system spilling over Russia and Arab countries), relocation of firms (agreements with trade unions in order to balance outsourcing and north-south win-win Regional economic growth), and - as we said before in the report (see. conclusion of part B) concerning the Kyoto issue - environment

(vii) possible coordination between public regulation agencies of northern and southern countries, for telecoms, air transport, health care etc.

F.2.2 CAN EUROPEAN REGION FIT WITH THIS "NORTH-SOUTH REGIONALISM" PATTERN?

In the case of Europe, it is very important to confirm or invalidate the geographical relevance of such an "European Region" if EU policy makers want to enhance an efficient neighbourhoods strategy. This implies, first, to check if this Regional European geography fits with the official European Neighbouring Policy delimitation, on both southern and eastern sides of UE.

The cartographic analysis of the organisation of space must drive, too, at identifying possible sub-regional processes: Baltic area, Black Sea and Western Balkans of course, but also Spain-Morocco links, that happen to strengthen since a few years, after the strategic change of the Spanish government that had refused hitherto to develop trade and migrations through the Gibraltar Strait; Istanbul-Greek Thrace-Bulgaria and Romania increasing links and potential growth of the Thessaloniki urban region in these cross-border area; maybe some Eastern Europe country relationship with some Russian area, despite the shift of their commercial

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[18] See for example Jacquet, P., Pisani-Ferry, J., Tubiana, L., 2001, *Gouvernance mondiale*, Conseil d'Analyse Economique, La Documentation Française, Paris ; Michalet, C-A., 2004 : *Qu'est-ce que la mondialisation ?* La Découverte, Paris ; IFRI, 2002, *Le commerce mondial au 21ème siècle*, Paris.

[19] "southern" means countries where costs for labour, real estates and other general expenses are lower than in the rich countries of a given region.

trade towards western Europe, etc. Answers to this geographic analysis will be of importance for Interreg recommendations. One of the main issue deals with Ukraine: in order to promote its role as a hinge to Russian space rather than as a barrier, it might be necessary to figure out a specific Interreg policy for that particular territory.

Concerning commercial geography, European policy makers should be very much aware of the weight of Europe for those of our neighbouring countries that do not play an significant role to our exportations, but that rely very much of European markets. Who knows in Europe that the small Tunisia makes the three quarters of its exportations with Europe (something like an 'European Porto Rico') ? And the very small Lebanon almost the half ? Should this dissymmetry be forgotten, UE itself would contribute to the general instability of its own neighbourhoods.

Another issue is the *very quick* changes in economics. A good and sustained geo-economic tool of observation would help policy makers to measure the impact of Association Agreements. For instance what about the Syrian balance of trade if EU signs the AA that the Allaouit government absolutely wants to sign for political reasons – but that its under-modernized enterprises absolutely fear?

Concerning investments, the *key issue* of the European Region is the low rate of investment in both eastern and southern countries, and namely the very low rate of foreign direct investments, and particularly of European foreign investments in theses countries. This makes a very unbalanced feature of Neighbouring countries that depend very much on European economy but do not benefit from European long term investments. This Euromediterranean specificity has to be mapped, showed and compared to what happens in other integrated Regions. What is at stake, is the participation of UE in the State and judicial reform of those countries in terms of good economic governance, lightening of public sector, transparency of markets, tax reform and so forth.

As we wrote before, this large view of the European Region is a mean to compete with the emerging Asian countries and above all with the US. The institutional limit of UE is not sufficient to measure the economic weight of Europe compared to US, one has to take into account their respective Regional influence too. A positive output of such a large Regional view would be to highlight the prominent role of European countries in their neighbourhoods. Most think (including in Brussels and Luxembourg perhaps ?) that US corporates dominate the whole world, including Middle East and even Maghreb. This is a strong mistake, which consequences are in economics but also in politics, especially for the Middle East Peace process.

Last, and as far as the Lisbon strategy is concerned, the Regional view make understandable that it is necessary to link migration policy and training policy (cross cutting analysis). UE has certainly to figure out new instruments for short-term flexible immigration, and, connected to that, new instruments for a training cooperation policy. Hitherto, the choice of most European countries has been to accept – not always in good conditions though – a number of foreign, and namely neighbouring, students; new patterns of Regional collaboration would rather drive at investing in local (meaning within neighbouring countries) capacities in training, in order to tackle the enormous call for training the trainers for the vast number of new students that arrive in the Arab universities. Again, this would be a win-win partnership: an increasing number of well trained technicians or engineers or workers for both southern countries and UE countries (that experience huge labour forces shortage) ; a shorten brain drain for southern countries; but also a new migration policy through common training networks, favouring many short term migrations form South to North and vice versa.

No mean to get through this, nor to build a new financial instrument for the Neighbourhoods in 2007, without a comprehensive geography of the whole Euromediterranean Region.

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