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Territorial Impact of Globalization for Europe and its Regions

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Annex

Working paper 1

"The process of regionalization and free trade areas"

Gilles Van Hamme, IGEAT-ULB, Yann Richard, Université Paris 1 Panthéon-Sorbonne

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Introduction

The objective of this working paper is to present the solutions explored to build world regionalization in order to compare the position of Europe in the world with the position of other world regions. The main constraint of the exercise is to produce comparable entity or comparable groups of countries in order to describe similarities and differences between ESPON region and other world regions on the competitiveness and cohesion criteria.

This working paper starts by the presentation of the theoretical background of the world regionalization and then we propose two main approaches to assess the position of Europe in the world. In the first one, we try to build two other challenging world regions based on the European Union definition and we describe the position of those regions in some indicator and also their internal disparities. In the second approach we choose to build world regions in order to see what will be the spatial extension of Europe and other world regions if they construction is based on the same method and following two main scenarios: the competitive scenario and the cohesion scenario.

1. Theoretical background: world regionalization

The act of dividing the world in different parts is absolutely not a neutral one. Building spatial units is a manifestation of the representation or even appropriation of the space, even when this space is the world. It is often the projection of a vision of the world, classifying the different places of the world according to a specific point of view (ex. the division of the world between “East”, “West” and “non-aligned” during the cold war). It is also a reduction of a large space into smaller parts, in order to make it more convenient for its management and its control.

Many divisions of the world coexist and they belong to different kinds. According to the literature reviewed two types of world divisions can be identified. First, some conceptual divisions of the world based on meta-geographies, i.e. “set of spatial structure through which people order their knowledge of the world” (Lewis & Wigen, 1997). Then, functional divisions of the world, that seems to be more neutral, but that are often also based on meta-geographies. Between those two kinds of divisions, a third intermediate one can be identified: the continents division of the world.

1.1. Review on existing divisions of the world

Cognitive divisions of the world

Based on a conceptual specific point of view of the word, divisions of the world placed in this category are both results and instrument of ideological power, as they are intensively used by politicians, diplomats and military strategists… (Gentelle 2008) As stated before, the East/West divisions of the world belong to this category but also the "North/South", "developed/under-developed". We should also add in this category the division of the world based on "civilizations" proposed by S. Huntington, mainly because of the correlative message of conflict associated with them. In these approaches the regions used are often quite simple stressing an opposition between two or three parts of the world and they reflect merely some stages in the geopolitical situation of the world in a globalization context for these reasons. This kind of divisions of the world cannot be used in this project.

An ancient subjective division of the world often used as operational neutral one: the continent

Facing the world realities, the continents seem too simple and they are built on the medieval European conception of the world in three parts according to the Bible, even if the discovery of America and later Australia make necessary the invention of new continents. Those historical constructions often seem neutral and even "innocent" but they raise more and more problem in the organization of information at the world level (Grataloup, 2009). They also raise the problem of the survival of a kind of geographical determinism as the social facts are interpreted within the continental framework (Lewis & Wigen, 1997). Despite this they are often used in statistical compilations at world level (mainly in UN, World Bank, WHO etc. statistical publications), with sometimes some refinements often based on a "civilizational" aspect as the separation between "Black" and "North" Africa. This world regionalization is the most anchored in cognitive representation of the world and it is nearly universally shared. Beyond the problems stressed below, the division of the world into continents raises the question of their limit: they are both variable (especially for Europe) and "fixed" (America /Africa separated by the Atlantic Ocean) according to the academic traditions and the variation of ideological points of views.

"Administrative" operational divisions of the world

The only universally accepted (or almost) division of the world is the state level. It is the base of the international relations, but it is not very relevant to conduct geographical analysis at the world level: sometimes it is necessary to compare group of states, sometimes we would like to have more information on the infra state level, especially when the countries are large and heterogeneous (Russia, Brazil, India, China etc.).

As far as grouping of states are considered, regionalization is a division of the world that emerges with the signature of cooperation treaties (mainly in trade). In this case, Regionalization is the building of regional economic groups of countries resulting from the signature of preferential agreements between their members. In 2004, 158 regional agreements were signed. The Treaty of

Roma signature in 1957 between six European countries, and three years later the creation of the European free trade association were followed by the setting up of other agreements mainly in Latin America and Africa. Today the regions formed represent more than 80% of the world trade. But those functional divisions of the world are not really operational for a geographical analysis at the world scale because some of them are overlapping and in the same time some spaces are excluded. In addition, it is difficult to use these groups because the situation is quite different in each "region" as far as the level of economic and politic integration is concerned.

Mixed divisions: administrative and global oriented divisions

The United nation statistical division proposes two main divisions of the world on its web page "Composition of macro geographical (continental) regions, geographical sub-regions, and selected economic and other groupings"[1]but unfortunately, the website does not explain how these divisions were built. The first division proposed is a hierarchical division in 4 levels. The first level is the world, the second one is called "macro regional" (continental) regions, the third one (geographical sub-regions) and the fourth one is the state. As stated before the "macro regional" division is a "continental" division in six parts with Africa, Americas, Asia, Europe and Oceania. Sub regions division is done following an apparently objective geographical perspective : the names used to describe the area are often the orientations (Eastern Europe, Northern Europe, Southern Europe, Western Europe), even if the indication of the direction do not solve the problem of the choice of the limits. In some cases other names are used for regions that are often considered as "natural regions" (Melanesia, Micronesia, Polynesia). In this first division, geography is mobilized to provide a division that seems neutral and objective. The other divisions proposed are grouped under the name "selected economic and other grouping". The first one classifies the geographical regions seen previously according to their level of development. Two "regions" are proposed: "developing regions" and developed regions. This quite simple division of the world is commented by a note stating that there is no "established convention for the designation of "developed" and "developing" countries or areas in the United Nations system" and restringing then the decision taken "in practice" concerning one particular country or region. This simple division in two regions is accompanied by another classification but with only one criterion for each of them (two regions are built that way: one corresponding to the criteria and one grouping the rest of the world countries). Those categories are: "Least developed countries", "Landlocked developing countries", "small island developing states" and finally "transition countries" that gather the countries "in transition from centrally planned to market economy".

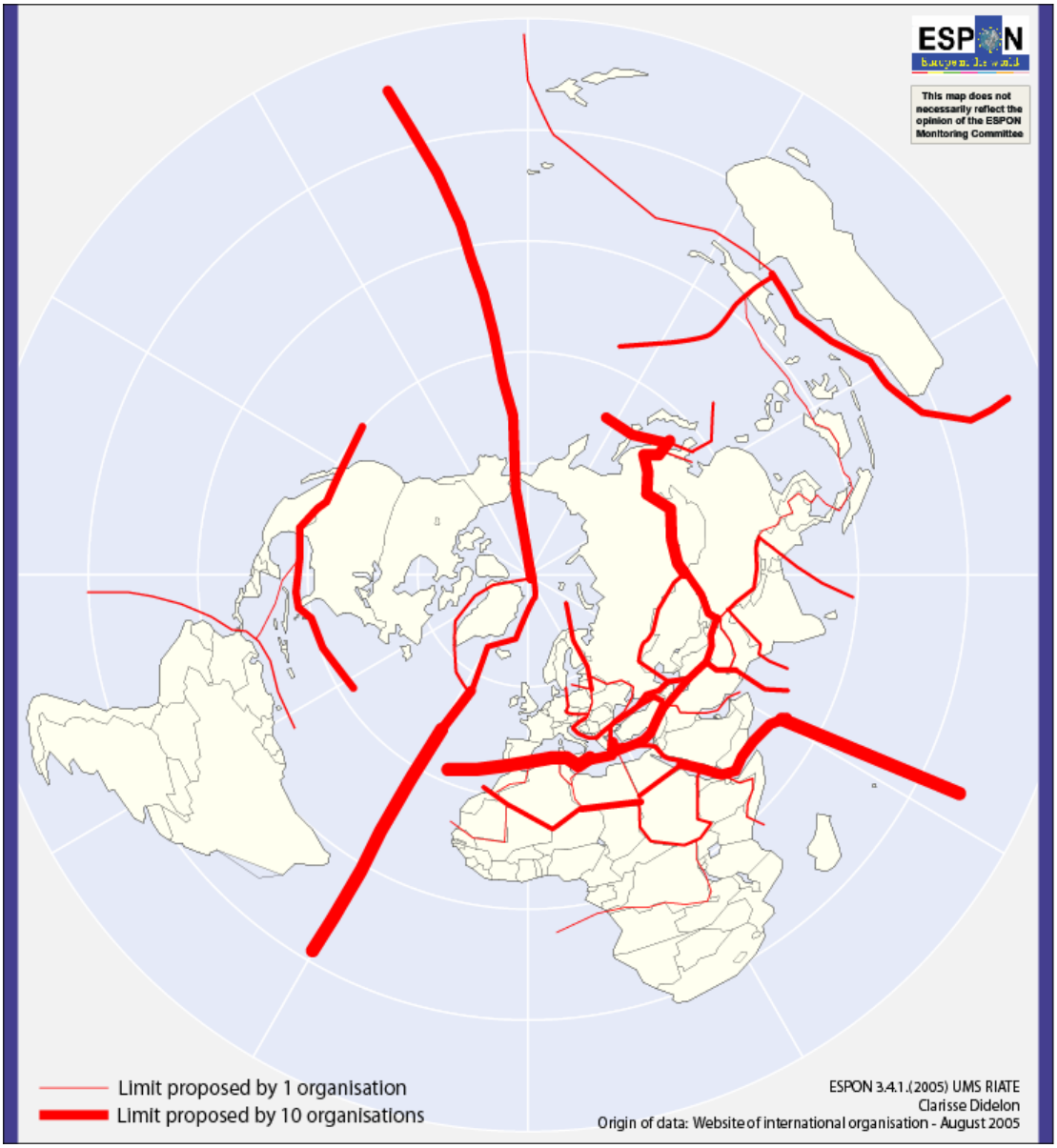
The **divisions of the world proposed by the World Bank** mix an economic, geographical and maybe cultural approach. On the page "countries and regions" of the World Bank web site[2] six are proposed; one exists and is not visible. The latter gather USA, Canada, Australia and developed countries in Europe in maybe a category "developed" economies". The rest of the world is where the World Bank deploys its activities. It is split in 6 regions (Africa, East Asia and Pacific, Europe and

[1]http://unstats.un.org/unsd/methods/m49/m49regin.htm
[2]http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/0,,pagePK:180619~theSitePK:136917,00.html

Central Asia, Latin America & Caribbean, Middle East & North Africa, South Asia) that seem to be built on geographical and cultural criteria.

Those are only two examples, but they are significant of the variation of administrative divisions both in term of limits but also of meaning of those divisions. Each firm of the world (Didelon, 2011), each country diplomatic service, each international organization develops its own world division (Didelon, 2006) that leads to a high variety of limits, even if some of them are very recurrent (Figure 1). This situation leads to the accumulation of artificially different visions of the world. It also makes it difficult to make regional comparisons and for actors at global level to coordinate together if necessary.

Figure 1 : international organizations limits



Functional divisions of the world

Finally, some other kind of regionalization exists at world level, based on functional approach. They may also be rooted in strong theories (Marxism, for instance). Here, the homogeneity criterion is not the most important one, but the complementarity or dependency between spatial units interlinked by flows of different nature. In this functional approach, we can firstly notice a "conceptual or ideological" vision of the world: the one that classifies world places in cores, semi peripheries and peripheries. This vision is roughly limited to an economic view of the world where places are more or less dominant in the production of goods and in the exchange flows. However, this division of the world can also be associated with development categories (Reynaud, 1981, Amin S., 1973) or with historical and geopolitical vision (Braudel, 1988, Wallerstein, 2006).

Secondly, we can notice a "functional" and "operational" division of the world: the one concerned by the areas of regional integration. Those areas are built by the signature of treaties on specific topics (mainly trade agreements) between some countries, generally on contiguous relationships. Those regions (ASEAN, EU, NAFTA, MERCOSUR etc.) have a concrete existence, but they are difficult to use in a comparison objective, because the integration level is not the same at all between the regions, and the treaties have not the same contents and objectives. Moreover, many integration regions co-exist and some countries could belong to two or more regions. The integration areas could then overlap and this is not very useful for comparisons.

"Researchers' operational divisions of the World"

All the previous divisions of the world described above are used in specific context (cognitive or operational) and they reveal often not very useful for analyzing phenomenon at the world level and for conducting comparisons between world regions. So, some attempts have been made by researchers to build their own world regionalization that could be useful in different context.

WUTS in ESPON. Some efforts exist to propose new **operating divisions** of the world but it is mainly in the academic world and those divisions are not very diffused. The WUTS (World unified territorial system) set up by the ESPON 3.4.1. "Europe in the World" is an example of academic operating division of the world (Didelon & Grasland, 2006). It is a proposal of harmonized hierarchical division of the world based on the example of NUTS (Nomenclature of Territorial Units for Statistics) created by Eurostat. This division of the world has purely statistical and cartographical objectives and it is organized in 6 hierarchical levels, from the level of States (WUTS5) to the level of the World (WUTS0). This WUTS system has been built through a participative method with all partners implied within the ESPON 3.4.1 project. A first division of the world has been proposed to discussion. The comments have been synthesized into a new proposal. This process went on until a consensus emerged on each particular case among the members of the team.

The WUTS system proposes 5 hierarchical levels, plus the world level:

- WUTS 0: the world
- WUTS 1: three global regions (EurAfrica, Americas, AsiaPacifica)
- WUTS 2: seven macro regions

- WUTS 3: seventeen meso regions.
- WUTS 4: twelve micro regions (only at the level of European Union and its neighbors).
- WUTS 5: States

One of the main advantages of the WUTS is the correlated comprehensive creation of nomenclature that allows aggregating or disaggregating easily the spatial units. That is very convenient for statistical and cartographical purposes. However the major critic that could be address to the WUTS is the methodology of building them. The first proposal was based on a "mixture" of conceptual visions of the world but also with some functional preoccupations. It used both the continental vision (visible in the names used), the north/south vision (making the WUTS 1 region as the grouping of a developed core and its "natural" semi peripheries and peripheries), but also a kind of civilization vision with for example the aggregation of "Latin America" on a language criteria and the apparition of a north African / Western Asian area that isolate the "Muslim world" that have merely the same extension has Huntington ones even if the authors stress that the economic and demographic dynamics have been the main criteria to build this area. As an example of "functional" criteria used in the constitution of WUTS, is the decision assumed by the authors to use the criteria of aggregate "which could be relevant for the elaboration of European policy recommendations or for the development of strategic Plans". This operating perspective is even more stressed by the flowing division in micro region that is only proposed for European Union and its neighbors. This Eurocentric way used to build world divisions was implied by the project orientation but it is quite damageable in a global perspective.

Last but not least, some even more subjective points of view have been mobilized for the elaboration of the WUTS. The division in seven meso-regions takes into account the results of the survey on the vision of the world of the ESPON program participants (made in Luxembourg in May 2005) and also some of the comments made by the partners during the process of proposals and feedbacks that were clearly based on mental representations.

1.2. Regionalization principle and time problems

The concept of regionalization is ambiguous because it is twofold. The first sense relates to the way one divides the global space. The second sense focuses the growing interaction between geographic neighboring territories, at different scales. They are three types of spatial regionalization:

- Regions may be considered as objects of mental spatial representation
- Functional regionalization is based on the growing exchanges and interactions between contiguous territories (Balassa, 1961, Baldwin, 1997)
- A homogeneous region is characterized by the combination of human, social, natural characteristics, whatever the size of the considered part of the earth surface is.

Thanks to its ambiguity, the concept of region is convenient because it can be applied at different scales, from the local to the global. As such, regions cannot be taken for granted. They are not given once for all. The regionalization is by definition an ever ongoing multifaceted process. It cannot be addressed without considering the time dimension. The limits of these regions are fuzzy and unstable

over time. Consequently, in this report the study of world regionalization spans over a period of almost twenty years (1989-2009).

The first sub-period starts in the 1980s, precisely at the moment when the global economy shifts from internationalization to globalization (Michalet, 1984). Besides, this moment is marked by the end of the cold war, which symbolizes the end of the two closed economic blocks and the progressive emergence of a polycentric world no more based on the traditional division of the world in "three" ensembles: the liberal and capitalist world, the communist world and the developing world. It also the moment when the closed regionalism is progressively replaced by an open regionalism (Gemdev, 1999)

The second sub-period (1995-1999) is marked by several economic and political dynamics: the acceleration of the transition of former communist countries to liberalism, the rapidly increasing number of regional agreements notified to the WTO, the extension of the scope of regional agreements from economic – first and foremost trade - to political issues,

The third sub-period (2005-2009) is marked by the emergence of polycentric world, on the economic and political points of view with the relative economic decline of the USA and European Union and with the arrival emerging economies on the global stage. It is also the moment when internationalization is replaced by globalization and open regionalization, with growing financial flows. This process is combined with a political one: emerging countries are more and more claiming for a new distribution of power at global scale and for better balanced relations.

1.3. Regionalization for comparison

Two main approaches can be used in order to build divisions. The first approach is "a priori". In this case the existence of geographical ensembles are acknowledged at the beginning of the process and then to identify the limits of those ensembles. The second approach is "a posteriori". This approach is allowed by the progresses in statistical and cartographical analysis. In this case, one phenomenon (or more) is studied and the aim is to identify thresholds in its variation in order to build regions that will be then defined.

A priori regionalization

In this approach the regions are defined on the basis of their names and then the spatial units are allocated to a region if they fit the definition of the region suggested by the name. For example, one can wish to define a "Central Europe" region (Sinnhuber, 1954). The name given a priori to the region implies some criteria for belonging or not to "Central Europe". Those criteria could be based on social, economic or cultural definitions of what is "central Europe" or even in physical criteria. Those criteria could be mobilized individually or together in the checking of the region limits in order to decide which country, or infra-national space could belong to this region.

This approach leads generally to the definition of the "core" of the region, i.e. the places that always belong to that region, but also to the definition of some margins describing how much the places belonging to the regions on all the criteria. This method then, very often leads to build fuzzy regions, as the limits drawn could be different for each indicator used in the definition of the region.

In a perspective of comparison of world regions, that kind of region building implies strong hypothesis on what we want to compare, because that will influence the criteria mobilized for building the regions. In the framework of the TIGER project, we have to compare the ESPON space with other "challenging" spaces. This approach will be used in the part II of this paper.

A posteriori regionalization

In this approach regions are built using some indicators and some methods, often statistical, based on two main concepts that define the region. Spatial units should be contiguous and as much homogeneous as possible to be grouped in the same region.

Contiguity is one of the first characteristic that regions should respect (Haggett, 1973, Dumolard, 1975, Béguin, 1979). When spatial units are not contiguous but joined in a same group by a statistical analysis the result is a classification or a typology but not a regionalization. The criterion of contiguity implies that the spatial units grouped can be considered as a coherent upper level spatial unit.

Homogeneity is the second most important criterion used in regionalization methods. It implies a relatively high level of similarity between the spatial units grouped in the same region. However the measure of homogeneity raises some problem, whatever the scale of the analysis, because of the variation of the definition and the shape of spatial units (MAUP, Openshaw, 1984) but also because that the homogeneity level decreases with the scale of observation: on a criteria, for example demographic behavior, a French department is more homogeneous than France and European Union. More, homogeneity implies some specific relations between the spatial units that are sometimes not sufficient to define a region. Homogeneity implies cooperation between the spatial units grouped in the region, when heterogeneity implies complementarity (Pumain, Saint Julien, 1997), as it is the case in the definition of functional regions. Finally, the definition of thresholds on the indicators used to measure the homogeneity is an important issue, because it will have a great influence in the shaping of regions.

Then, when the regions are formed, they are analyzed thanks to the description of the distribution of the indicators used, and then defined: a name can be given to them or, sometimes only a short description. It is very important to be very careful in the choice of indicators because they will define the "theme" of the region formed and then the regions.

In this approach, the regions obtained will be comparable because they are built in the same way. What will be compared are the relative variations of the indicators between the regions, but also the shape and extension of regions.

2. ESPON compared with two "comparable world regions"

One main objective of our work package is to analyze the position of Europe in the world, and the evolution of this position and more precisely with world regions perceived as "challenging" one. In a first part we will present how we chose the regions and then present some results comparing ESPON region with other world regions.

2.1. An empirical solution: choice of regions & method

One first possible approach to try to assess the ESPON region within the world is to build empirically comparable regions. Many solutions are possible, but from a "competitive" perspective it was clear that the ESPON region should be compared with the traditional challenging countries of European economies: the USA and Japan[3]. However it does not seem very relevant to compare one group of countries in one hand and single countries on the other hand as the challenge faced by the two kinds of geographical objects are quite different. The solidarity ideal of the European Union at stake in the majority of ESPON countries belonging to the European Union and the cohesion perspective of the European regional policy could eventually be compared to what could happen in a single country like USA or Japan. But in Europe, economic and social policies are still very much conducted at the national level. One solution could be then to analyze groups of countries with European countries but in this case, the solidarity between countries does not exist in the other region. Anyway, it seems that the problem cannot be solved and European Union cannot be really compared with any world countries whatever its size or to other world regions because of it extreme particularities. But still we have to compare the ESPON region with other part of the world.

To conduct this comparison we decided to empirically build world regions based on the model of European Union, knowing they will be very imperfect, taking into account both competitive and cohesion perspective. So we examined what are the overall performances of the regions compared to EU countries ones, but also what kind of problems the other regions would face if they were as integrated as European Union, for example in term on internal disparities? To build those "comparable regions" we decided to take into account the following criteria:

- The countries should belong, at least partly to **regional trade area**. This criterion is used because the integration levels of European countries are very high and this is one of the main characteristic of the European region. In institutionalization regional organization countries agree of a number of rules that implies high level of intra block trade. We choose then, in order to have the two other challenging poles of the triad to focus on NAFTA (USA, Canada, Mexico) and on ASEAN+3. Indeed ASEAN groups together 10 countries (Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei, Vietnam, Laos, Myanmar and Cambodia). This regional block does not cover all the relevant countries for a comparison

[3] And this was indeed clearly stated by the ESPON CU in the term of reference of the TIGER project

with ESPON region. We decided then to refer to the ASEAN + 3 organization which is a meeting that takes place during the ASEAN submits. The number 3 refers to China, Japan and South Korea that are important economic and politic actors of the region.

- The area should contain **industrialized and rich countries** as it is the case in Europe. This was one of the reasons why we decided to work on ASEAN+3: we wanted to take Japan and Korean into account, but also the rich and industrial coastal Chinese provinces.
- The area should be characterized by a **certain level of internal disparities** because disparities can be important on some indicators between the European countries. For example, the GDP per capita of Luxembourg was 17 times more important than the one of Bulgaria in 2009 according to the World Bank. This implies specific issues in the regional policy. If not "regional policy" is implemented in NAFTA or ASEAN +3, it worth to take the internal disparities of those regions into account, even in a hypothetical way.
- To keep close to the definition of region we finally chose to maintain **a high level of spatial contiguity**, even if it is more difficult to the ASEAN+3 regions that is characterized by the presence of many island countries.

Finally, the choice to compare ESPON space with NAFTA and ASEAN3 (Figure 2) seems the less imperfect one. We propose then to compare the ESPON space with a north American region (Canada, USA, Mexico) where indicators will be gathered an infra state level for USA and Canada. Those 3 countries belong to NAFTA that is not really comparable to EU in term of political agreement but still some trade agreement exists in the region. It is a region with rich countries and regions, with old industrialization (Easter coast of USA and Canada). Internal disparities exist even if they are less important than in the two other regions (Figure 3).

Figure 2 : world regions to be compared with ESPON

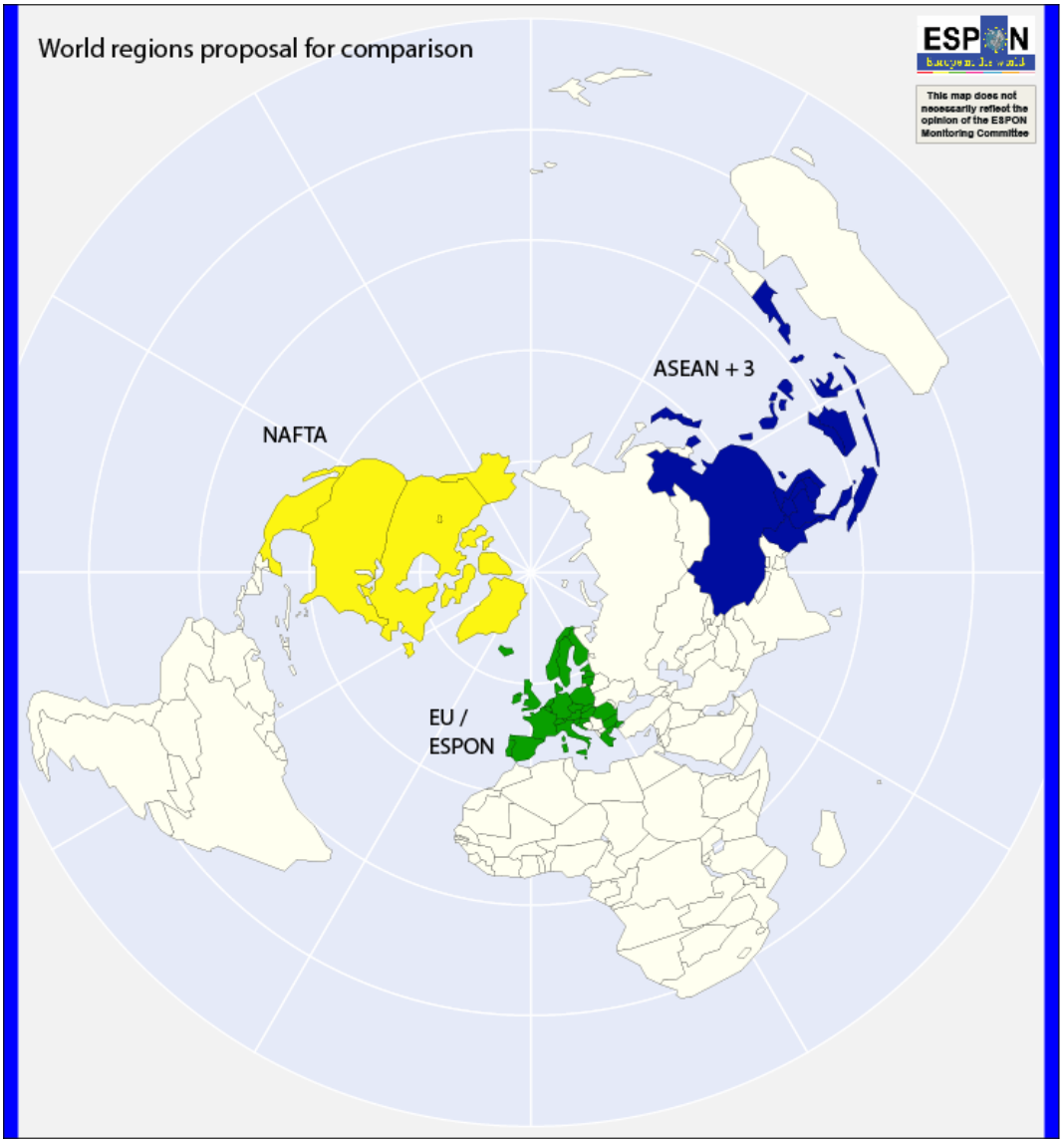


Figure 3 : comparison of the 3 world regions compared

	NAFTA	ESPON	ASEAN +3
Nb of countries	3	32	14
Population	413 millions	566 millions	1989 millions
GDP / capita	22 500	15 000	5 000
Integration level	Not so high	Very high	Low
Disparities	x 4	x 12	x 20

The second region we would like to compare with the European Union is the Asiatic one. The ASEAN+3 region has been kept in order to introduce rich and industrialized countries (Japan, Korea)

and internal disparities. The contiguity criterion shows a specific figure because of the importance of sea in the region but anyway there is a high level of regional trade. It is the poorest region of the group with the highest level of internal disparities.

The regions built allow first to conduct regional comparison on some indicators but more on the evolution of these indicators both on the thematic on competitiveness and social and territorial cohesion. The realization of graphic representing the evolution is quite interesting because it allows having a glimpse on figures values and on the trends at the same time. It also softens up the impact of possible low quality data reported from local levels. In some cases it allows to relative some discourses on the position of Europe in the world and on the challenge of other world regions, mainly the Asiatic one. We will take here four relevant examples, which illustrate the relevant domain of comparison: GDP per capita, literacy rate, public expenditure in R&D and CO^2 rejected by GDP. More, in order to focus on the three regions internal spatial structure and to conduct more accurate comparisons than the one made at the regional level we choose focus on the intraregional mapping of some indicator and more to split the largest countries in regions, using the infra-national level to collect data and make maps. The three largest countries of our sample are China, USA and Canada, can be compared to a certain extend in term of surface to the ESPON space. They can face high level of internal disparities that could implied challenges that could be to a certain extent be compared to the challenges faced by the European Union in the framework of the regional policy. This approach reduces dramatically the number of thematic variables that can be used in the analysis, because of the lack of infra-national data and because sometimes they are not built in the same way.

To conduct those regional comparisons we decided to map the indicators collected in a certain way detailed below:

- ⇨ We choose first to focus on the comparison between the three regions. To do so each indicator collected has been mapped using exactly the same categorization for the three regions. The system of the reference is the group of spatial units (mixing national and infra-national entities) of the three regions. The categorization chosen is by deciles that allow locating easily the 10% of the highest values and the 10% of the lowest. So, if a region appears in dark color it would gather the highest values and if it appears in light color it would gather the lowest. This approach does not take into account the rest of the world but it allows comparing quite precisely the trends and spatial organization of the three regions.
- ⇨ When it is possible i.e. when we succeed to find data at different dates we decided to map the growth rate of the indicators using the same method than the one described previously.
- ⇨ Finally we decided also to map the intraregional standard deviation for each indicator. Here the system of reference is each of the regions taken individually but the fact that the deviation to the average is standardized allows us to build comparable categories and to compare easily the maps obtained.

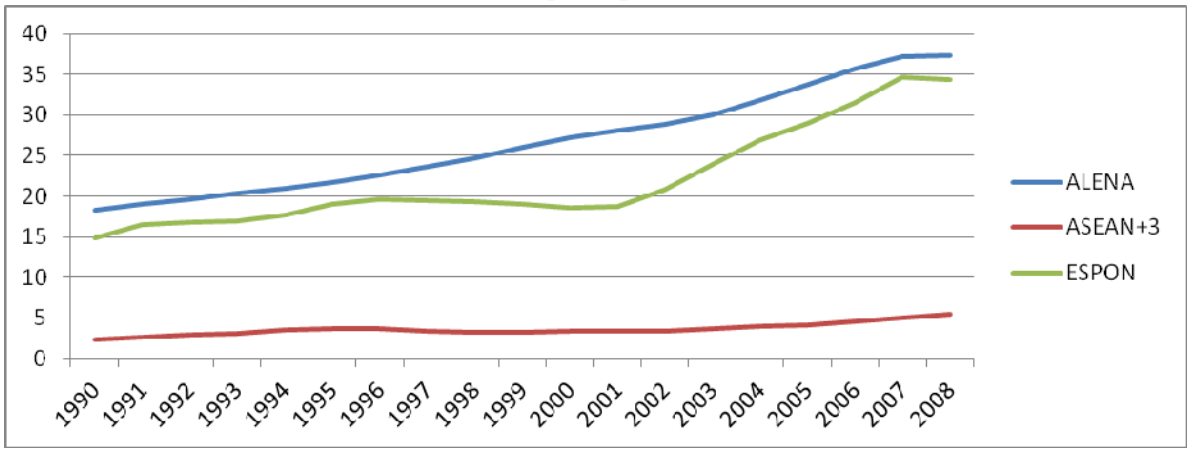
2.2. Comparison of EU in term of "competitiveness"

One possibility to assess the position of Europe in the world in terms of strength or weakness toward globalization trends is to concentrate the analysis on economic indicators (Foreign Direct Investments distribution, Gross Domestic Product etc…). However we assume that concentrate only on wealth comparison and trade opportunities for Europe in the world is a quite restrictive approach to the study of processes of globalization and that "international competition" should not be restricted to a competition based on wealth levels. If we want to keep strictly in line with the **competiveness** approach of the Lisbon strategy we can, at least add to the traditional indicators on wealth (GDP, GDP per capita) and population, indicators that could take into account the "competitive knowledge-based economy" aspect. For example, indicators on telecommunication equipment levels and on education are available in world databases such as "International Telecommunication Union" and UNESCO, and often over a long term period.

The GDP per capita

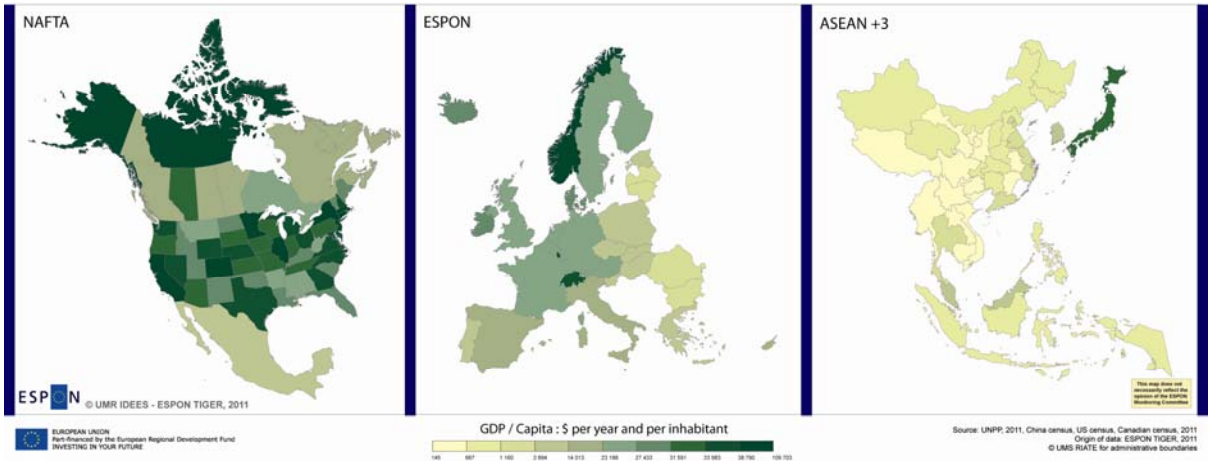
The GDP per capita is one of the most used indicators in order to compare the position of one country or region in the world to the other. In the three world regions analyzed here (NAFTA, ASEAN+3, ESPON), the GDP per capita grown significantly between 1990 and 2008 (Figure 4). The GDP per capita observed here is obtained by making the relation between the total GDP and the total population of each region. In the three regions it has been multiplied by two or more between 1990 and 2008 (NAFTA: x 2; ASEAN+3 and ESPON: x 2.3). However the figures of the beginning of the period are quite different. The GDP per capita of the ASEAN+3 region was around 2 400$ per capita when the GDP per capita of NAFTA and ESPON reached values between 15 000 and 20 000$. Therefore NAFTA is still the richest region compare to ESPON, and despite an important growth, the ASEAN+3 region reaches only 5 500$ per capita in 2008. This differentiated situation in terms of GDP value is quite evident on the maps of this indicator (Figure 5 & Figure 6).

Figure 4: evolution of GDP per capita ('000 dollars) (1990-2008)



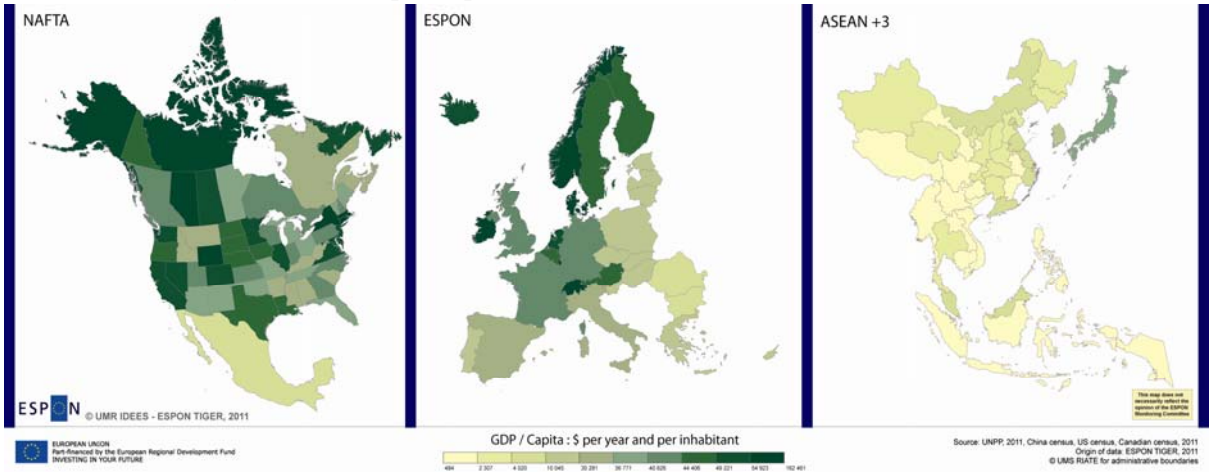
At both dates the mapping of the GDP per capita in a comparable way allows stressing the existence of important gaps of wealth between the three regions. Globally NAFTA and ESPON region appear in dark colors: they gather mainly all the richest spatial units. On the contrary the ASEAN+3 region appears in lighter colors that characterize the presence of the majority of the poorest spatial units with the exception of Japan. The richest spatial units of ASEAN+3 region (Malaysia, South Korea, and Shanghai) reach the level of Mexico or eastern (Estonia, Poland, Czech Republic, Slovakia and Hungary) and southern European (Greece and Portugal) countries.

Figure 5 : GDP per capita in NAFTA, ESPON and ASEAN +3 in 2001



The general structures are not really different in 2001 and 2008, but the situation seems relatively better for some Canadian provinces (Alberta, Northwest Territories & Nunavut in 01 plus Manitoba & Newfoundland & Labrador in 2008) and European countries, especially northern European countries, Ireland and Austria in Europe that implied an increase of the differences between the European countries. On the contrary the situation seems relatively worse in ASEAN+3 region with the degradation of the relative position of Japan, but also of Malaysia, Indonesia that appear in lighter colors than in 2001. Some United-States States also experience a decrease of their GDP per capita like Arizona, Idaho, Montana or South Carolina for instance.

Figure 6 : GDP per capita in NAFTA, ESPON and ASEAN +3 in 2008

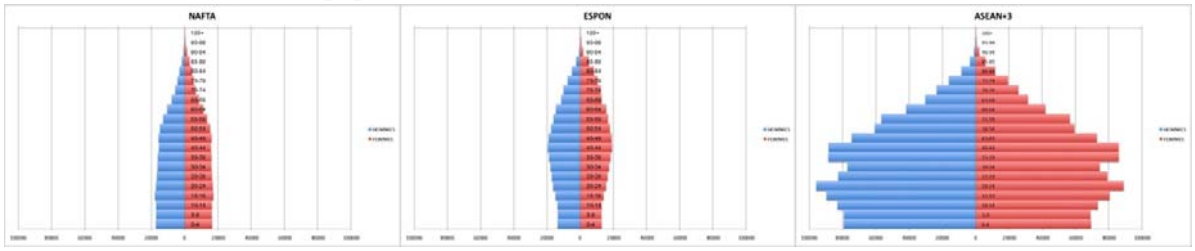


From the beginning of the 90s to 2010, as far as the GDP per capita is concerned, both in terms of value and evolution the EU and NAFTA situations are comparable, although internal disparities are important (see next section). Those two regions are undoubtedly richer and the evolution allow to be confident to for the future, even is the financial crisis from 2008 could darken the perspectives.

Population and demographic trends

The population indicator can also be used as an indicator for competitiveness, not so much in term of total population (even if population weight is often considered as a good indicator for power), but for the trends of the demographic evolution. In term of total population, there is no doubt that the ASEAN+3 region is much more populated that ESPON and NAFTA. At this end of the first decade of the 21st century, ASEAN+3 region raised more than 2 milliard inhabitants when ESPON and NAFTA reach respectively 507 and 442 million. The population structure is also quite different (Figure 7). The ageing of population seems more advanced in the ESPON region than in NAFTA. If some ageing trend can be also observed in ASEAN+3, the proportion of old people on the active population is still low, even if it blurs internal disparities. The median age indicator summarize well the situation: it is only about 31 years in NAFTA, nearly 40 years in ESPON and 35 years in NAFTA.

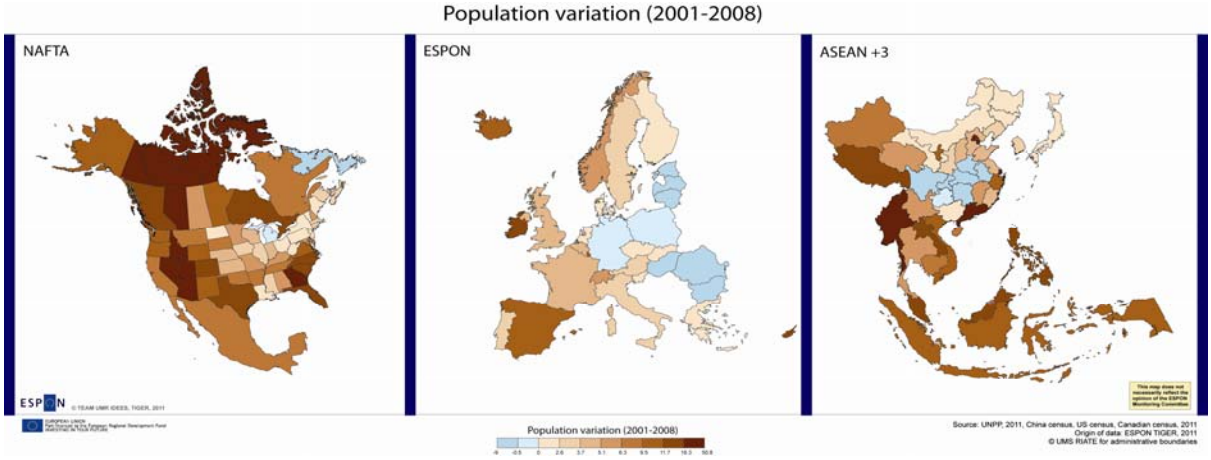
Figure 7 : population structure of NAFTA, ESPON and ASEAN +3



Source: UNPP, 2011

In accordance with those trends, the population variation of the three regions between 2001 and 2008 shows some interesting trends. In the three regions, some countries or provinces or states experience a population decrease (Figure 8). The trend seems more important for ESPON were numerous eastern countries are affected but also Germany. In ESPON the decrease of population can be explained by the ageing population trend (Germany) and by the crisis that affected eastern countries after the end the soviet system. In ASEAN+3, only some central Chinese provinces are affected by population decrease. In those provinces the ageing trend could also have an influence, but the migration deficit can also explain the trend.

Figure 8 : population variation in NAFTA, ESPON and ASEAN+3 between 2001 and 2008



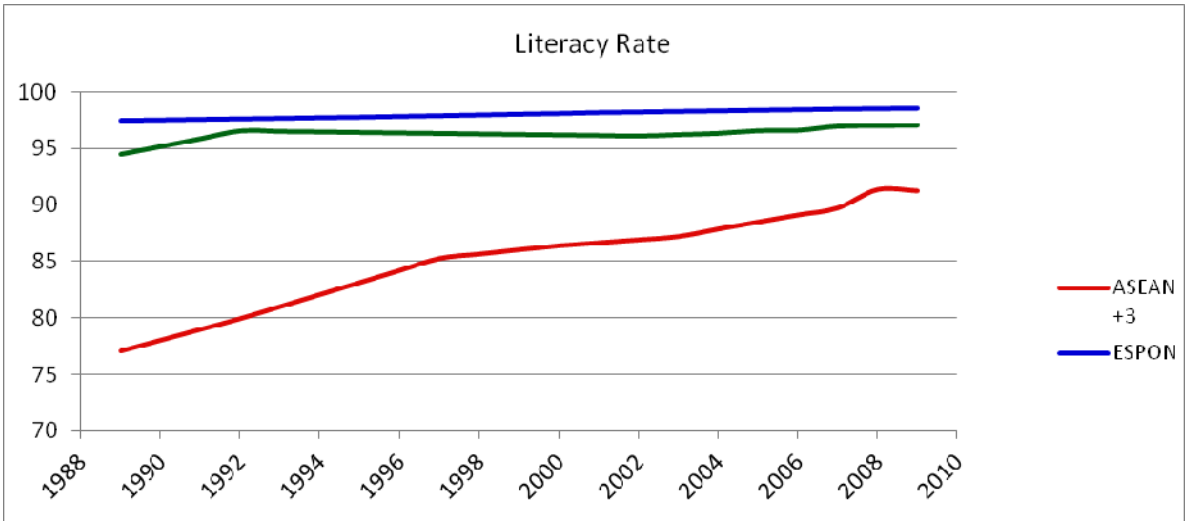
The knowledge economy

The knowledge economy paradigm is based on the idea that the production of knowledge could become the base of the economy, instead of industrial production in the context of des-industrialization of most advanced economies. Knowledge can be considered both as a tool or a product. It is based on three main pillars: education, research and development and information and communications technologies.

As far as the education is concerned, the graph on the **evolution of the literacy rate** (Figure 9) shows that the ESPON space position is the best compared to the two other world regions and is the highest and the most stable on the all period. The high value of the ESPON space is not a surprise as in Europe nearly all the population is literate[4]. In NAFTA, the lowest figure in 1989 is due to the low literacy rate of Mexico at the beginning of the period. But what it is striking is the literacy rate of the ASEAN+3 region. In 1989 the literacy rate was not so high in the region (77%) with high disparities between the countries. Twenty years later impressive progresses have been made and the value reaches 91%. Yet it is still lower than the ESPON space literacy rate. But what it is at stake as far as the literacy rate is concerned? A low literacy rate can be considered first as an indicator of a low level of social cohesion in the countries of the region analyzed because it could reveal some problems in the school system. That means that a certain share of children does not attend school or leave school very early in their life. Population non literate often earn low wages. That could be an advantage for the country that can maintain a certain level of competitiveness in low skill industrial jobs but it is also a problem as far as the high added values jobs are concerned. The literacy rate evolution could mean that for the while the competition in mainly between NAFTA and ESPON on "high value added jobs" and that the position of ASEAN has been to compete on a salary during a long time period but that the things are changing because the literacy rate is increasing in the region.

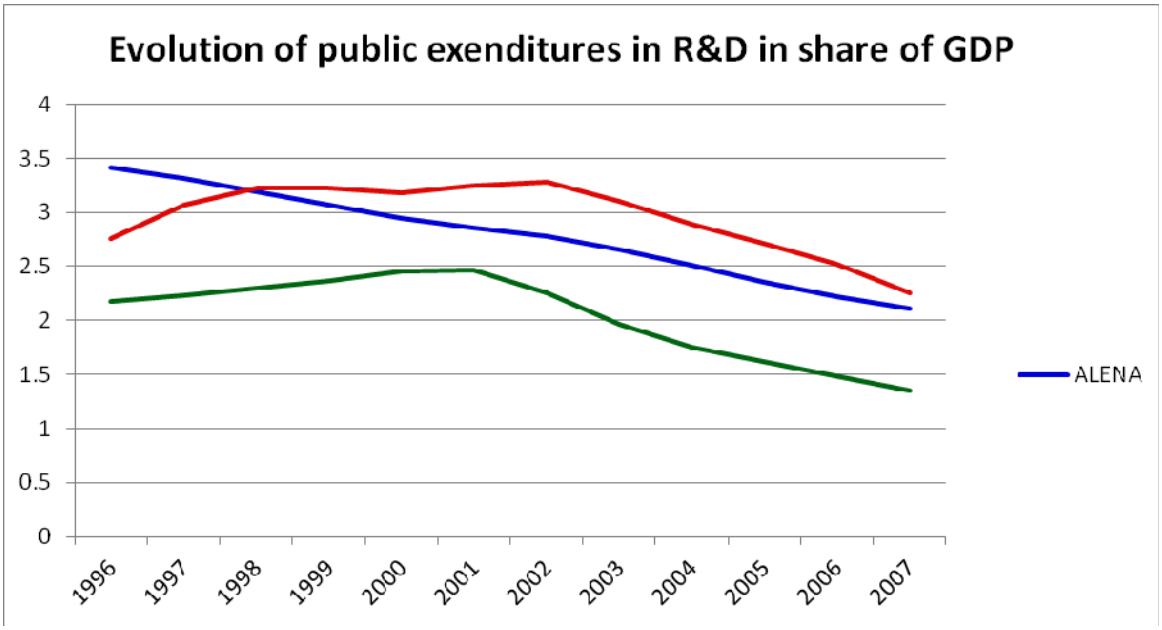
Figure 9 : evolution of literacy rate (1989-2009) in NAFTA, ESPON and ASEAN+3

[4] However there are still some problems, minimized by the European countries.



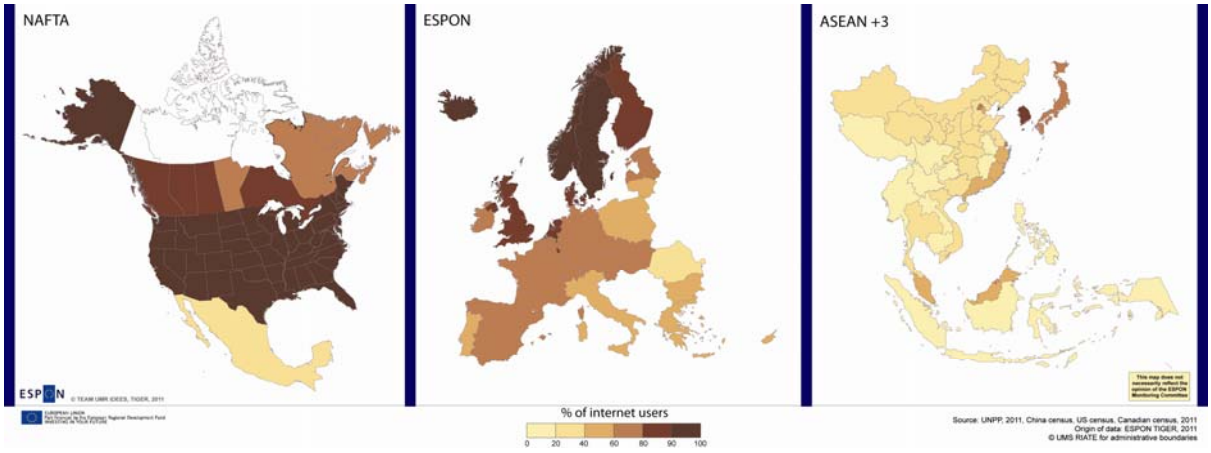
What confirms the competition of ASEAN+3 on the sector of high value added activities is the evolution of the **public expenditures in research and development as a share of GDP (**Figure 10**)**. The share of public expenditures has dramatically decreased in all regions between 1996 and 2007 but what it is striking is the position of the ESPON space: it is here the lowest of the three regions compared both at the beginning and the end of the period. That is quite contradictory with the wish to make Europe the leader of the knowledge economy.

Figure 10 : evolution of public expenditure in R&D in share of GDP (1996-2007) in NAFTA, ESPON and ASEAN+3



The mapping of the **Internet user's rate** (Figure 11) shows that EU is in a globally medium position between NAFTA where the rate is very high everywhere except in Mexico and ASEAN+3 where the rate is low everywhere expect in Korea, Japan, Malaysia and some coastal province of China. The situation is quite well differentiated and the position of EU is an average one. However on should keep in mind that the growth rate is quite differentiated also and that they are very high in Asia.

Figure 11 : internet users as a percentage of population in NAFTA, ESPON and ASEA+3 in 2009



The situation of ESPON in term of knowledge economy is partly secured by the high literacy rate values that show the existence of a general access to education system and a relatively good rate of Internet users. However the investments of States in R&D are much lower than in other regions. This is an argument to augur in favor of an increasing competition of other regions and more precisely of the ASEAN+3 region in this domain.

2.3. Comparison of EU in term of territorial and social cohesion

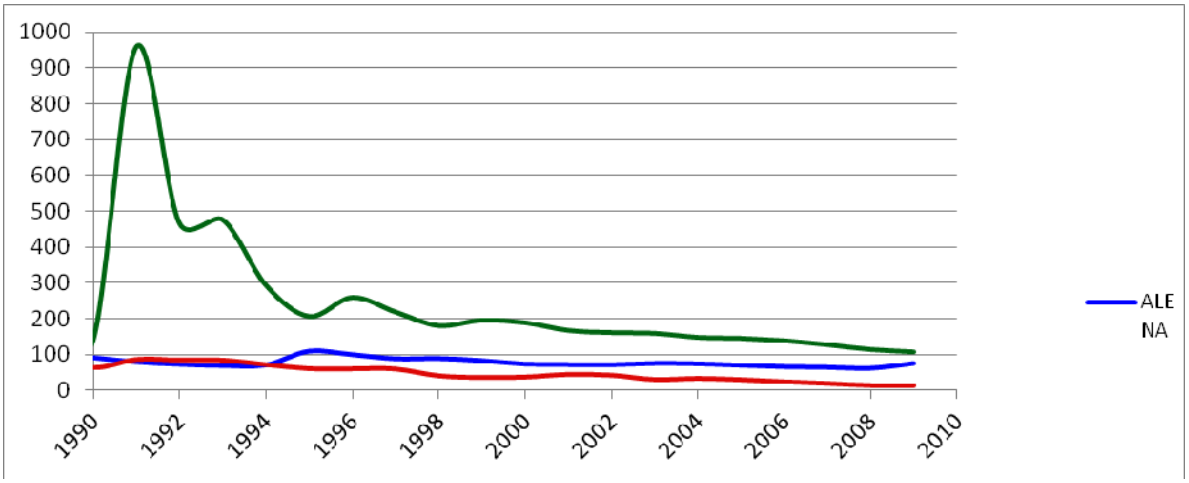
The competitiveness approach seems quite restrictive. The world is not only divided according to wealth or to economic opportunities, but also according to the social development level and levels of wellbeing of the population. The European Union territory is often perceived in the world as a space where life is "easier". In term of globalization, this approach should not be neglected first because it is one of the factors that can explain world level mobility, then because it is a factor of stability that is also quite important in a globalization perspective, especially in a long term perspective. This is why indicators of **social cohesion** are also included in our analysis.

Disparities in term of GDP per inhabitants

The global growth of the GDP per capita of the three regions is impressive (see previous section) but still **great disparities can be observed** between the countries of the three regions in term of national GDP per capita. The disparities are measured here by the difference between the richest and the poorest country of the region at each date. The evolution of the intra region disparities are given here with a base 100 reference in 1989 (Figure 12). However it should be notice that the figures are quite different at the beginning of the period. In 1989, the Japan population was nearly 570 times richer

than Cambodia (and 240 times richer than Vietnam the second poorest country of the region) when Switzerland was "only" 16 times richer than Poland and USA 8 times richer than Mexico. Within the period the intra region disparities decreased dramatically in ASEAN+3 (Asian development Bank, 2009) region as they have been nearly divided by 10. The Japan GDP per capita is "only" 70 times more important than the Myanmar one. The GDP per capita disparities between the countries of NAFTA was stable during the all period with a low but irregular decrease. In the ESPON region the situation at the beginning and the end of the period is quite similar: the Luxembourg GDP per capita is 17 times more important than the Bulgaria's one in 2009. However between the two dates the ESPON region undergoes a very important increase of internal disparities that have nearly been multiplied by 10 between 1989 and 1991. It is due to the increasing difference between western European countries where the GDP per capita were still growing and the eastern European countries where the GDP per capita temporally collapsed after the fall of the Soviet empire and the reorganization (and liberalization) of the national economies. Yet, despite ESPON region faced a challenge like no other region of the world during this period, the disparities values of the region in 2009 reached nearly the value of 1989, showing the overall solidity of the region and its capacity to face internal challenges (mainly thanks to the process of enlargement of the European Union ?).

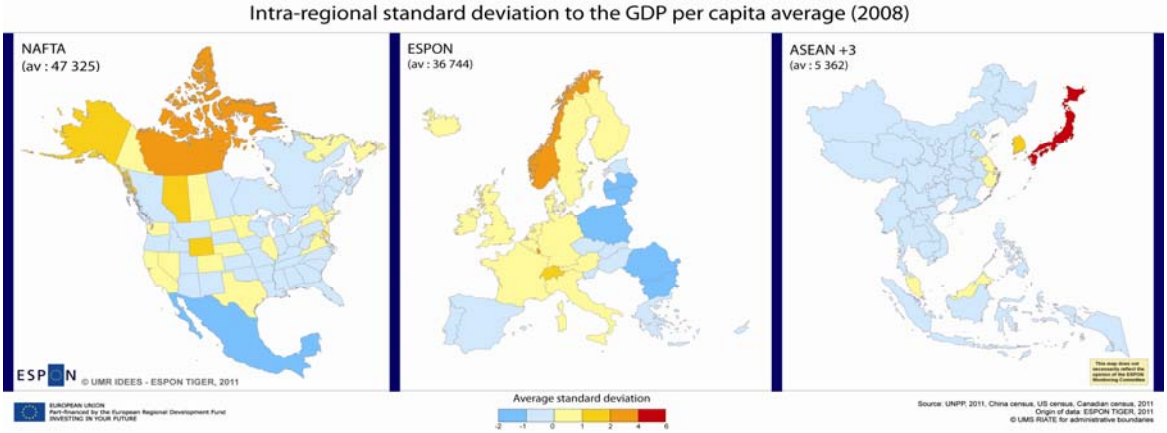
Figure 12 : evolution of the intra-zone disparities in GDP for NAFTA, ESPON and ASEAN+3 between 1989 and 2009



As far as intra-regional disparities (measured here by standard deviation) is concerned (Figure 13), the situation in NAFTA and ESPON seems globally comparable with two "oil spatial unit" (Nunavut and Norway) quite different because of relatively high values of GDP per capita; but also with Mexico in one hand and Latvia, Lithuania, Poland, Romania and Bulgaria on the other hand even if it is quite different because of relatively low values of GDP per capita. But many countries are in light yellow or light blue showing light difference between the spatial units and the region average, which points out a certain level of homogeneity. In the ASEAN+3 region the situation is quite different because the disparities between Japan and the rest of the spatial units is so important that nearly all spatial units are not differentiated and are colored in light blue. This stresses quite different situations. In the first one the spatial units are more differentiated but the disparities are not so high and the cooperation between spatial units could be less difficult in a regional policy perspective like

in European Union. In the second one, spatial units are more similar, with one very much different that would imply that Japan would bear alone the efforts of a hypothetical regional policy.

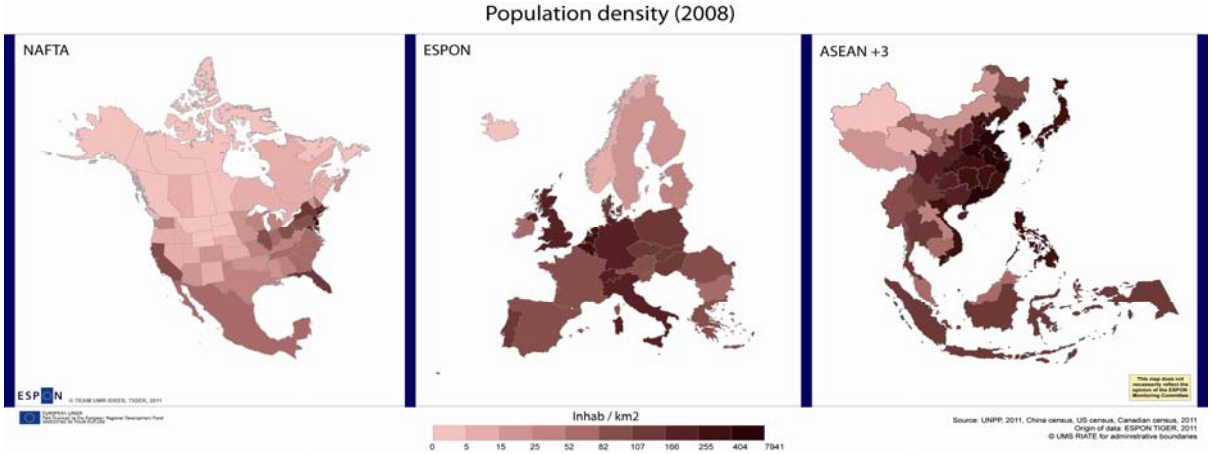
Figure 13 : intra-regional standard deviation to the GDP per capita average (2008)



Disparities in term of population repartition

Disparities in population repartition can be considered as a challenge for a territory, especially in the context of the European regional policy where the policies tend to make equal the access to infrastructure and services to all population. The population density of the ESPON region is relatively high compare to other world regions and particularly NAFTA. Nevertheless the population density of ASEAN+3 region reaches more higher values (Figure 14). The repartition of densities shows fewer disparities (using the national level values) in ESPON than in the other regions mobilized for the comparison especially in China where the difference between the coastal region and north western Chinese provinces are very high.

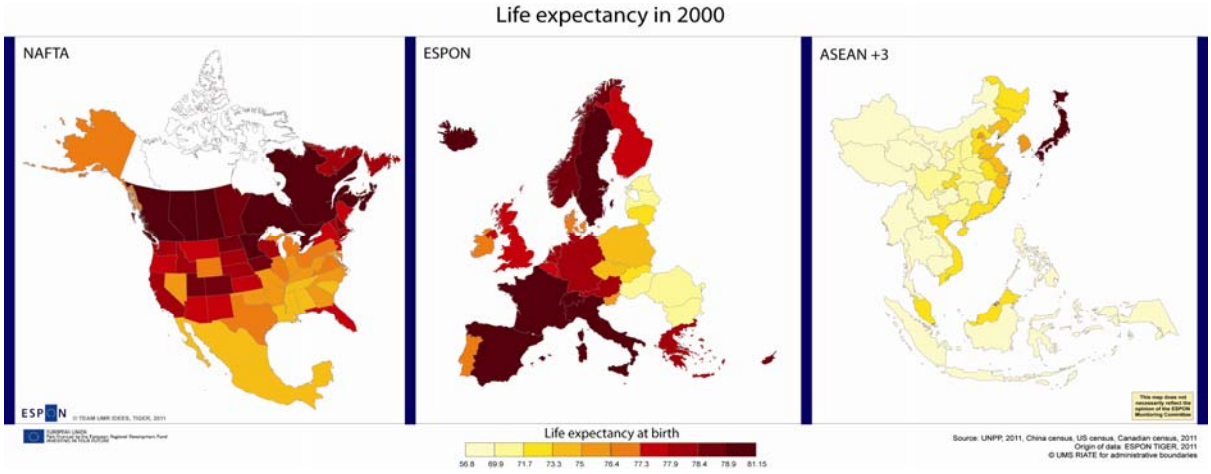
Figure 14 : population density in NAFTA, ESPON and ASEAN3 in 2008



Life expectancy in 2000

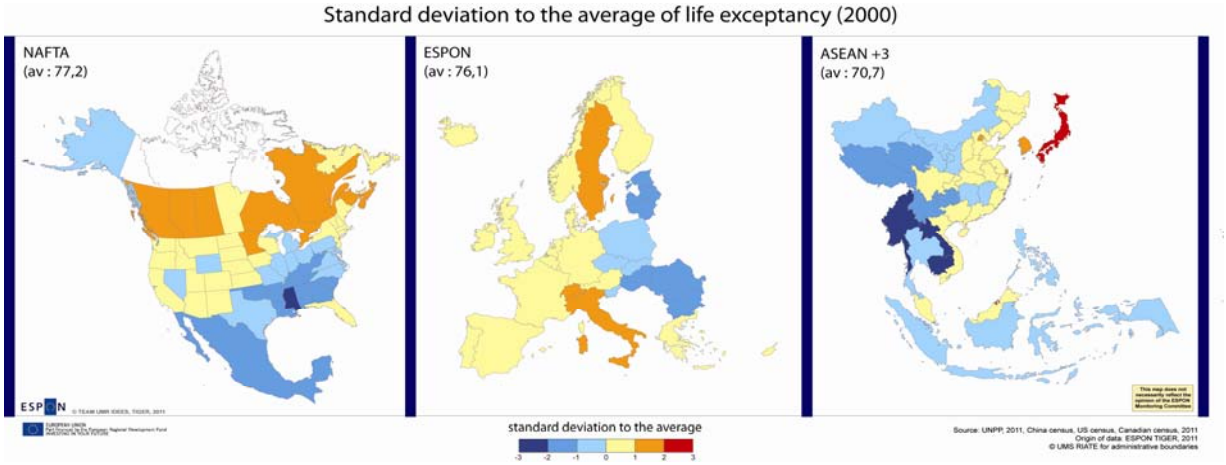
Life expectancy is an interesting indicator because it reflects well the social and health situation of people in the different countries and the efficiency of the health system that is one important indicator for the analysis of cohesion. The mapping of life expectancy at birth in 2000 in the three regions built for the comparison shows as in the previous case, the existence of important difference between the regions (Figure 15). NAFTA and ESPON show quite similar values, except rather low value in some eastern European countries (Estonia, Latvia, Slovenia, Romania and Bulgaria). However the variation of value in NAFTA and ESPON regions show a spatial structure quite different and more "organized" than in the case of the variation of GDP per capita. In NAFAT there is globally a decreasing of GDP per capita from north-west to south-east, where social disparities are high. In Europe, there is globally a decreasing for south-west to north-east with the exception of Scandinavian countries. In ASEAN+3, the situation is quite different: the majority of spatial units show relatively low values of life expectancy. With the exception of Japan, the highest values in these regions are similar to the lowest values in NAFTA and ESPON.

Figure 15 : life expectancy in NAFTA, ESPON and ASEAN+3 in 2000



The mapping of the internal disparities (Figure 16) shows that the life expectancy disparities in NAFTA and ESPON are comparable between them, but also comparable with the disparities statistical distribution observed for GDP. In ASEAN+3 the situation is quite different with a very high level of internal disparities between Myanmar and Cambodia in one hand and Japan in the other hand.

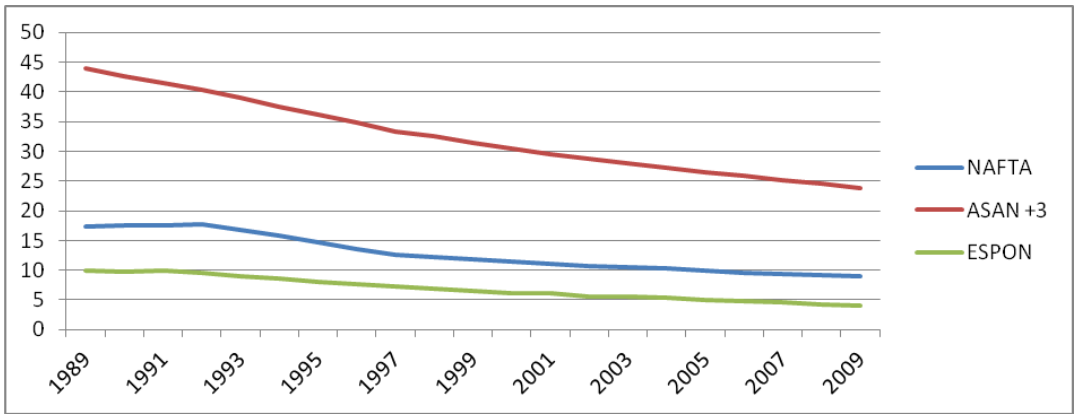
Figure 16 : standard deviation to the average of life expectancy by region (NAFTA, ESPON and ASEAN+3) in 2000



Infant mortality

Another interesting indicator reflecting the sanitary situation of a territory is the infant mortality. It is an alternative indicator to measure the well-being (OECD, 2006), as well as the ability of the health care systems to prevent diseases of mothers and children. The graph of the evolution of this indicator between 1980 and 2009 (Figure 17) shows that the position of EU is the best with the lowest infant mortality rate and more, that the situation is still improving. Globally those two indicators indicate that EU perform relatively well in the social cohesion domain even if the causal link between GDP per capita and sanitary situation cannot be denied. Yet, GDP per capita is correlated with a better health, at least in terms of averages, but the link between the GDP variation and the variation of these indicators is less strong.

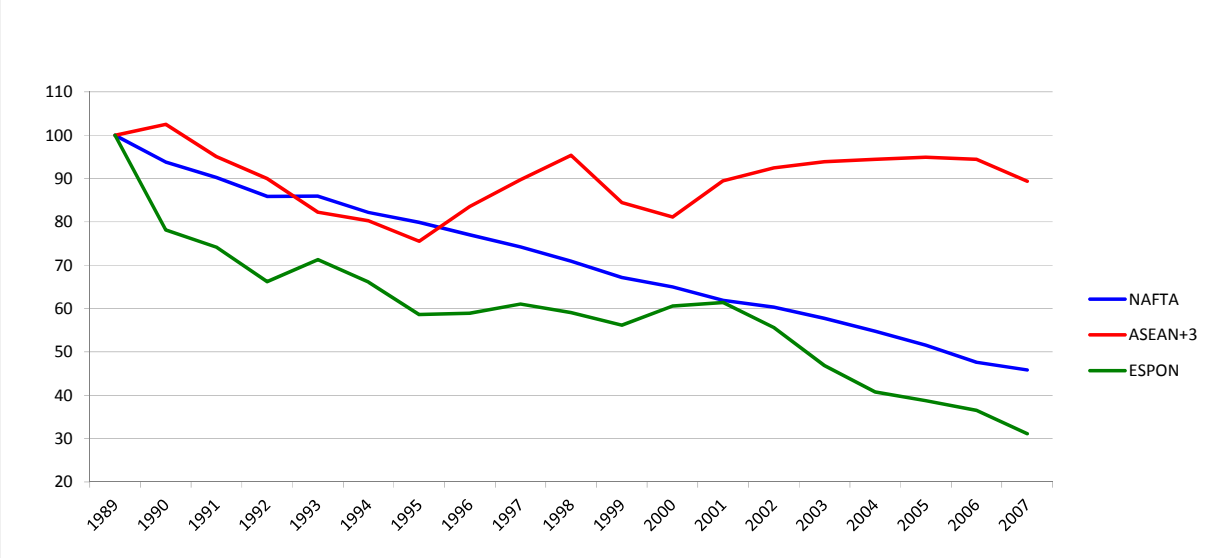
Figure 17 : evolution of infant mortality rate per 1000 living birth (1989-2009) in NAFTA, ESPON and ASEAN+3



Comparison of EU in term of environmental issues

A last indicator allows comparing the position of ESPON region with the two other challenging world regions. The environmental issue has been stress in most of the European Union publications and some environmental rules have been set up. An indicator could allow measuring the impact of efforts of each region in the environmental issue is the **ratio between the CO^2 emissions and the GDP** (Figure 18). It could be understand of the measure of "how much each region need to reject CO^2 to produce 1$ of GDP. In the three regions the GDP increased during the period but the CO^2 emission varies differently: they have been multiplied by 2.3 in the ASEAN+3 region, by 1.21 in the NAFTA region but they have decreased in the ESPON region (x 0.9). In consequence the CO^2 emission by GDP evolution is quite different in the three regions (base 100 in 1989). ESPON and NAFTA need less and less to reject CO^2 to produce GDP but ESPON countries decrease is the most important. ASEAN+3 emissions by GDP are quite irregular by globally stable on the period. Those figure could be interpret as the fact that ESPON region make great efforts to reject less CO^2. In one sense it is true. But one should not forget than the delocalization of industry toward the developing ASEAN+3 countries also contribute to the delocalization… the CO^2 emissions.

Figure 18 : CO^2 emission by GDP (index 100 in 1989)



Globally the ESPON region performs well compare to the other regions on social indicator with a global good level of living that can be depicted by the access to health. However, the internal disparities are high within the ESPON territory. Those disparities can partly be explained by the backwardness of some of the former eastern countries in some domains and the crisis experience after the drop of the iron curtain. The enlargement process of the European Union and the regional policy set up in those countries after they became member States allow them to converge with the indicator levels of the former member States.

2.4. Interest, limits and prospects for a comparative approach

In this comparison of ESPON with other world regions, we choose the "a priori" regionalization approach. The construction of those regions is based on strong hypothesis that lead to introduce bias in the analysis. We defined what the ESPON space characteristics are and we tried to build comparable world regions.

The visions produced of the three regions are quite interesting because they allow giving a relative position of each region compared to the other, both in time perspective (graphics) and spatial perspective (maps of the three regions). After this reviewing of some trends and situations concerning few indicators depicting both competiveness and social and territorial cohesion, we can assume that the ESPON region has relatively quite good position according to the used indicators. This is quite important to relativize the discourse on the emergence of ASEAN+3 region. We cannot deny that ASEAN+3 is an emerging space. However the indicators show that the gap is still high compared to NAFTA and ESPON and that its situation is somehow fragile on social aspects. For some economic indicators, the analysis of post 2008 economic crisis data could moderate or increase trends that are identified. They were unfortunately not available at the provincial or state levels yet.

This approach allows also, and it is maybe the most interesting, to compare the internal disparities of the regions built, that is, according to us, quite important because the European Union construction deals with the internal disparities, mainly with the regional policy, and that solidarity between European countries is a European specificity. It provides then a general framework for discussing two hypotheses:

- What would be the challenges faced by the other regions with the similar integration level?
- What would be the situation of ESPON countries if they would not be a member of the European Union?

Indeed, those questions are very important and very relevant because this way of comparing ESPON is quite artificial because it is very difficult to build objects really comparable to ESPON and more to European Union: the European space is very much specific because of the regional integration level and it is impossible to find strictly comparable spaces in the world.

3. Regionalization for comparison

European Union is a political and institutional construction that implies specific relations between the European infra level territories (i.e. countries or regions). The integration level is deeper in the EU and it implies solidarity processes between European regions, mainly through the regional policy: richest countries contribute, to certain extend to the development of the poorest countries of the region in an institutionalized way and that is one of the founding ideals of the European Union. This mechanism could happen, to a certain extent in other world countries but absolutely not at the supra national regional level. In consequence, in a global concurrence context, one could say that other competitive world countries have not to suffer to that kind of mechanism that dedicate a part of "the national wealth" to the development of other countries. But one could also argue that other poor or backward countries in the world do not benefit from the support from other countries.

This highlights the problem of the building of regions for comparison. So, to come back to this problem of comparison of Europe with other world regions we choose in this section to adopt approach without any political correctness. We choose to build some synthetic indicators in order to build some regions and test them without any a priori geopolitical definition of the world regions we would obtain. That means that European Union / ESPON space is no more considered as a "sacred" space that one should not shrink or enlarge.

We first present the method we implemented and then two brief example of the method used on rather simple indicators: GDP and HDI. Then we explore possible regionalization with two approaches based on the ideas of competitiveness and cohesion. In the first situation we use first the "competitiveness synthetic indicator". The aim is to build block of countries that, put together could be very competitive on the world stage. In this approach, countries will be selected to take part to a world region if the competitive indicators values are high (GDP, R&D etc…) and if there is not too much difference between them. What will be interesting in these hypotheses will be to check what are the countries we should "cut off" from the European Union / ESPON space to allow this region to be the most competitive on the world stage. In the second situation we use the "cohesion synthetic indicator". The aim is to build block of countries that imply a certain level of intra-regional mutual assistance. In this approach, the "cohesions" indicators are used and we allow aggregations with more differences between the countries. What will be interesting here will be to see what will be the spatial configuration of other world regions if they had the same "cohesion" ideal than European Union (but it is not sure that EU keeps its present spatial configuration).

3.1 Regionalization by aggregation to core with contiguity constraints

Method and implementation

To conduct this regionalization we use spatial statistics and spatial analysis methods and explore the fuzzy indicators methods. The fuzzy regionalization allows building "maximum" and "minimum"

world regions. The “minimum regions” pattern shows what should be the spatial pattern of the « Competitive European Union » (what countries should we drop from the EU to be competitive). The “maximum regions” pattern shows what should be the spatial pattern of the other « cohesion regions » in the world. Different choices had to be made in order to implement test the scenarios described previously and to conduct regionalization. A software application has been built introducing our regionalization parameters in order to build regions[5]. The choices made to build this application are detailed here.

Local maximum: “core” for global regionalization

To conduct our regionalization we choose to start from the local maximum, i.e. the states that show the highest value of the indicator used to conduct the regionalization. In both scenario (competitiveness and cohesion) the local maximum appear as structuring spatial entity. It is a leader in the competition process and it is the main contributor in the cohesion process. The problem here is that the number of local maximum could be very important, leading to the building to a large number of world regions. We decided to introduce a threshold to the fact a specific country can be used as a local maximum. The reference will be a parameter of the indicator used at the world level (for example, the mean or the median), introducing the strong hypothesis that, to be the support of a kind a regionalization a country should be “strong enough” on the world scene; otherwise the structuring effect of a higher local maximum could interfere. The choice of the thresholds should have to be deepened. This parameter will be called: “the global reference”

Introduction of the contiguity constraint

The main constraint we choose to use intensively in order to build region is the contiguity criterion (see part one). It was introduce in the regionalization application first by a terrestrial contiguity matrix between states. The use of this matrix raised many problems. For example, Great Britain could only be “regionalized” with Ireland, because of a common border. More no world region could really emerge in South East Asia or Caribbean because of the importance of island countries in those parts of the world. However relations are very important in those countries and it would be non-sense to isolate them. So, in a second step we introduced a contiguity matrix with a maritime buffer zone of 450 kilometers. That means that, in a certain way, the countries that have a coastline are “increased” of 450 km. If their new border “meets” another border we consider that the countries are contiguous. The maximum maritime distance between countries considered as contiguous is 900 km that allows maintaining intensive relations. For the while tests are somehow convincing to use this contiguity matrix; however the contiguity criteria still should be strengthen.

Aggregation thresholds

The last parameter on which we have to take decision is the aggregation threshold criteria that are a measure of the difference between the countries.

In a first step the value of reference is the value shown by the local maximum. If a country is similar to certain extend to the local maximum it can be placed in the same region that will show a certain level of homogeneity. If both are two much different, they had to be placed in different region, of

[5] We thank you very much Patrice Langlois a retired but passionate researcher from UMR IDEES for his contribution in the building of this application. Without his help it would have been impossible for us, or it would have taken a very very long time to us to learn to write informatic programs.

even not placed in any region, in order to preserve the homogeneity of the regions formed. This aggregation thresholds will vary according to the scenario tested. If the scenario is the competitiveness one, the threshold will be very discriminating and not some much difference will be allowed between the countries put in the same regions. If the scenario is the cohesion one, the threshold will be more "permissive" in order to allow a more important heterogeneity. Further than this general law, the threshold values still have to be fixed.

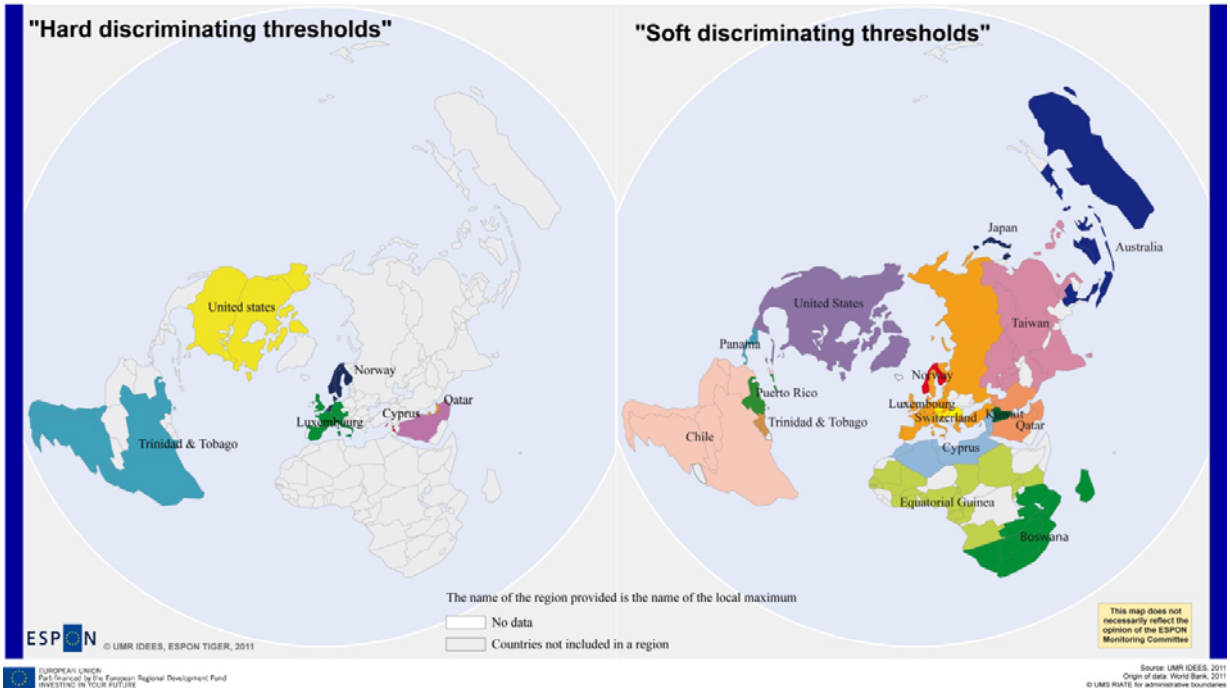
In a rather pedagogical approach we choose here to show some results of the regionalization method we implemented using the GDP per capita in 2009 and the HDI indicator in 2009 before presenting the regionalization made using synthetic indicators on cohesion and competitiveness.

Example of regionalization using the GDP indicator

We used first this simple indicator (GDP per capita in 2009) because people are really used to it and the test implemented here will be easier to catch. We decided to check how the regions built vary according the thresholds chosen.

We first tested an approach with "hard" discriminating thresholds. The local maximums are kept in the test only if they belong to the 25% of the richest countries of the world (global reference). The contiguous countries are aggregated in the same class than the local maximum if the difference is equal or lower than 50%. That corresponds, for example to the difference between the second richest United-states state (Delaware) and the poorest one (Mississippi) (The district of Columbia, the richest state seems too much particular). The hypothesis is that region should be able to bear an internal difference a least equal to the national United-States disparity, because it is often seen as "competitive" and then we can make the hypotheses that the regions built could be competitive.
Then, we tested an approach with soft" discriminating thresholds. The world median is chosen as the global reference and the local maximum is kept in the test only if it belongs to the 50% richest countries of the world. The contiguous countries are aggregated in the same class than the local maximum if the difference is equal or lower than 95%. That corresponds to the difference between Bulgaria and Luxembourg respectively the poorest and richest European countries. The hypothesis is that region built should be able to bear more important internal differences a least equal to the European Union internal disparities in term of GDP because the EU had set up a regional policy that aim to increase the internal cohesion. The implementation of the test provides the following results shown on the maps below (Figure 19).

Figure 19 : example of world regionalization for GDP



The differences between both maps are quite significant. On the first one, using the "hard discriminating threshold" only 6 world regions appear and a lot a countries are not included in a region. Europe Union countries are split in three parts: one grouped around Luxembourg and gathering richest western European countries. A second European region is built around Norway and gathers northern European countries: Belgium, Netherlands, Denmark, Sweden and Finland. The small third region is built around Cyprus and gathers Israel and Jordan. United States is grouped only with Canada; Japan does not appear as a center of region because it is too much different from its neighbors.

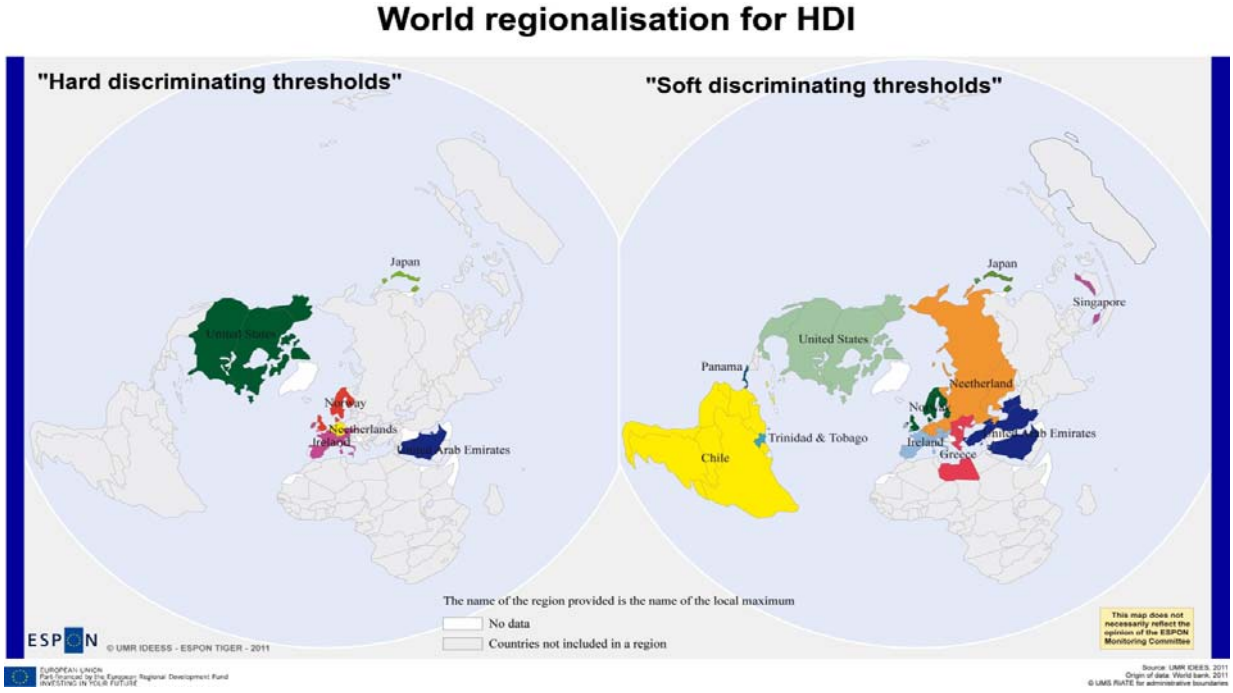
On the second map, using the "soft discriminating threshold" the number of regions obtained is quite more important (15) and only few countries of the world are not included in a region, being too poor compared to their neighbors. In Europe a fourth region appeared around Switzerland and gathering mainly central and eastern countries like Austria, Hungary and Romania. The western European previous region extends very far to include Russia and Turkey and the "soft threshold" regionalization allows "stealing" some countries to the Norway previously identified region. The Cyprus region extends very much to include the North African and Middle East countries.

Example of regionalization using the Human development Index

We choose then to test the application with a more complex indicator that is an indicator summarizing three themes: life expectancy, education level and income index and that is close from the kind of indicator we would like to build. The same method has been used than for the previous indicator.

We first tested the "hard" discriminating thresholds. For the competitiveness scenario, the global reference is the 25% the most developed countries. For the aggregation threshold we choose to use the difference value between the most and least developed states of the United States (Connecticut and Mississippi): 10%.
For the "soft" discriminating thresholds, the global reference is the 50% most developed countries. For the aggregation threshold we choose the difference value between the most and least developed countries of the European Union in 2009 : Ireland and Bulgaria: 20%.

Figure 20 : example of world regionalization for HDI



In the first approach (Figure 20), only six world regions appear and 3 of them split the north eastern European countries in a Norway, Ireland and Netherlands regions. The three other regions, grouping few countries are built around United-States, Japan and United Arab Emirates. In the second approach, 11 world regions are formed but still a lot of world countries are not included in a region: the majority of them being in African and in Asia where the HDI values should be not high enough to constitute the core of a region or the HDI values being too much different between the countries. A fourth region appears in Europe, built around Greece and including Libya and Balkan countries. One more time, it is interesting to notice that, even if the aggregation threshold is based on the intra-European disparities, European Union is split in four world regions, two of them trespassing the admitted limits of Europe to Include Libya (Greece region) and Russia & Kazakhstan (Netherlands region).

3.2 Regionalization using cohesion indicator

The main approach here is to build a "synthetic" indicators being used as "cohesion indicator". We first explain the indicator construction. Then we make some test on regionalization using different thresholds and then we try to characterize and compare the regions obtained.

3.2.1. Building of the cohesion indicator

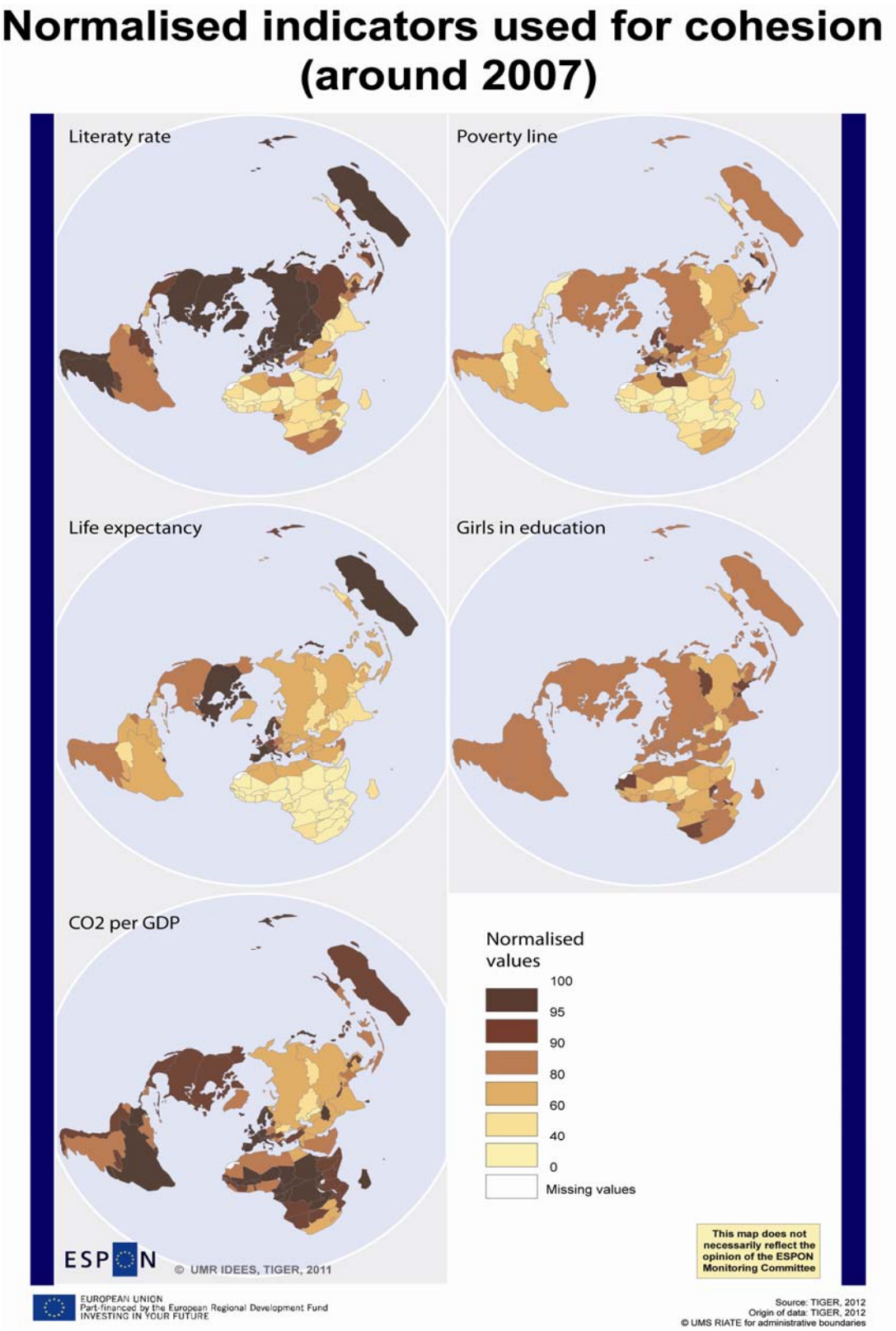
To build the cohesion synthetic indicators we first had to check on the database gathered in the TIGER project framework the available data around a specific date (2007-2009). We try to gather characters describing different topic, but one main difficulty was the lack of data for some countries or some dates. Taking those constraints into account we finally choose **5 indicators reflecting different social topics**.

- ⇨ Population under the poverty line. This variable is used to describe the poverty and inequality level within the countries
- ⇨ Literacy rate. This variable is used to describe the access to primary education
- ⇨ Girls in primary education. This variable is used to introduce a gender approach in the index
- ⇨ CO2 per GDP. This variable is used to take into account the environmental issue
- ⇨ Life expectancy. This variable is used as an indicator of the countries health system.

Due to the method used in the regionalization and the weight of the contiguity constraint it was absolutely necessary **to complete the maximum of the missing values** of the chosen indicators. Then, we calculated the correlation coefficient between each indicator listed below and some well-known reliable complete indicators (GDP per capita and HDI at the same date). When the correlation was significant we used the regression equation to complete the missing values. If it was not significant we estimate the missing value with the average of the neighboring countries. More in each situation we try to find other sources for the indicator (for example national sources) to check the reliability of the estimated value when it was possible.

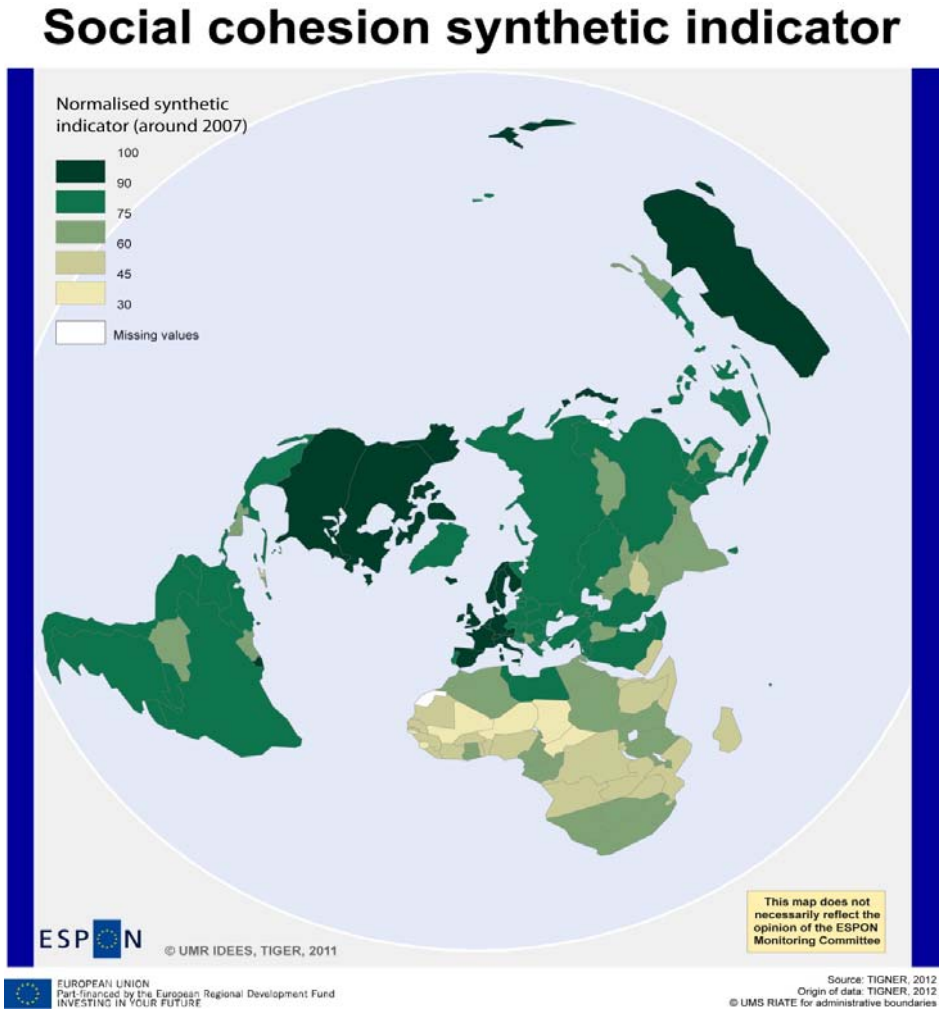
The **indicators have been then normalized** (Bouchon-Meunier, 1995), between their respective minimum and maximum values in order to make them comparable and make them have the same weight in the building of the synthetic indicator on cohesion. Some of those indicators seem correlated positively or negatively (Figure 21) and we can observe they introduce strong differences between the countries.

Figure 21 : normalized indicators included in the cohesion synthetic indicator (around 2007)



The synthetic indicator is the average of all the normalized values of the characters listed above. The mapping of the social cohesion synthetic indicator allows stressing the existence of important disparities at the world level (Figure 22). The situation in North American, Japan, Australia and north-western European countries is the best with high value of the cohesion index; the situation in central and western Africa is the worst with very low values of the index. Nevertheless we can observe that the structure of this index at this world level varies according a rather continuous figure. That means that it will be possible to build some regions even if we introduced some constraints on contiguity between countries.

Figure 22 : the social cohesion synthetic index



3.2.2. Variation of constraints for regionalization

Like in the example developed previously for GDP and HDI, we explore regionalization using different thresholds for the choice of local maximum (the countries that will serve as "core" of classes) and also for the choice of the level of difference allowed in the aggregation process. The threshold for the core selection is more discriminant as only one quarter of the countries that obtain the best value are "allowed" to be used to become a core. The two columns of the next figure (Figure

24) show the differences in the cores selection thresholds. On the left column only 25% of the highest values countries can become a core and then a base for a region building. On the right column, half of the world countries could possibly become a local maximum. Then, the line of the figure show the variation of the threshold for the aggregation in term of percentage of difference allowed between the local maximum and the country that would obtain the lowest value of the region as far as the cohesion indicator is concerned. Like previously, the number and the shapes of regions vary very much in the process (Figure 24). The names given to the regions (tables and maps) formed are the name of the local maximum core.

We describe here one of the regionalization obtained with the core selection level at 25% (quintile) and aggregation threshold at 20% (maximum difference allowed between the core and other countries). This method allows building nine regions with very different size in term of number of countries, surface, population. Most of them seem coherent from a spatial point of view except the huge "Taiwan" region (orange color) from Mexico to Libya. Interestingly European countries are split in five regions for of them having European countries as core ("Sweden", "Switzerland", "Netherland" and "Cyprus") and some of them being included in the "Taiwan" core region (Greece and Bulgaria). Some of the European cores include extra European countries: Tunisia joins the "Switzerland" core region and Iran, Saudi Arabia, Syria, etc. join the "Cyprus" core region. As far as the cohesion indicators are concerned we notice (Figure 23) that Europe is split between two rich regions with good scores on cohesion indicators ("Sweden" and "Netherland"), that even reach better level than the value for the ESPON area. The "Switzerland" region gathers south and east Europe countries and show lowest value.

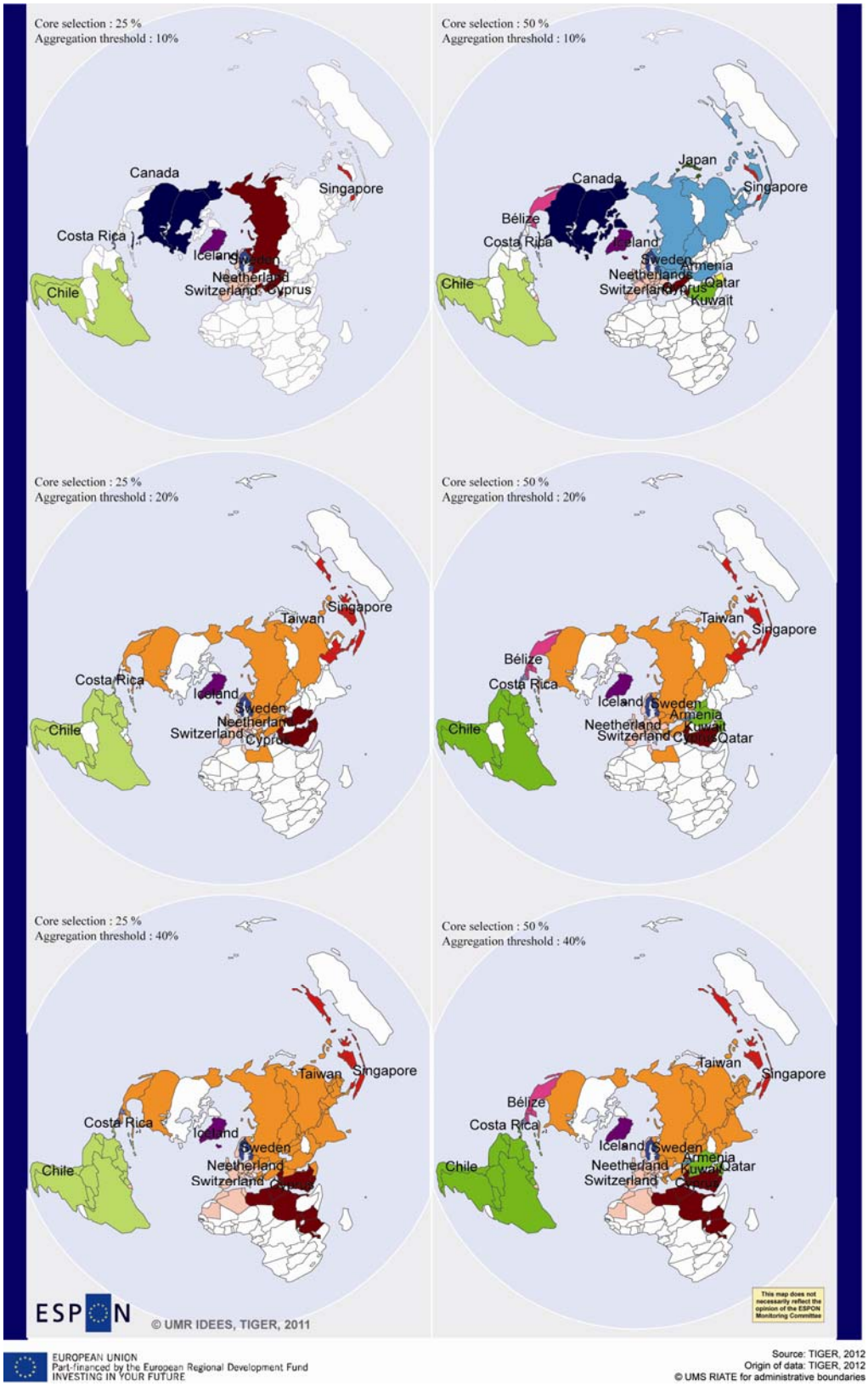
Finally, this method for building region shows that we cannot obtain coherent European region that could be comparable at the world level. This is due both to the existence of different cores (4 local maximum able to structure a region) and to the disparities observed in Europe as far as the cohesion indicators used here are concerned.

Figure 23 : values of general indicators for the regions obtained using the cohesion synthetic indicator for regionalization

Indicator (2007)	Chile	Costa Rica	Cyprus	Iceland	Neetherland	Singapore	Sweden	Switzerland	Taiwan
NB of countries	17	4	19	2	2	4	5	26	43
GDP PPP (billions of US $)	2739	89	1284	17	1244	833	766	15424	25545
Population (million inhabitants)	404	29	338	0	27	263	21	528	4145
GDP per capita ($)	6775	3045	3804	46374	45976	3163	35700	29225	6164
Life expectancy (years)	72	73	66	75	78	71	75	77	71
Rate of Internet users (%)	27	13	11	85	78	12	75	52	17
Employement rate*	58,6	58,1	58,4	-	52,5	63,2	54,4	50,3	57,4
Child mortality (per 1000 births)	25,1	20,8	38,5	-	3,9	23,1	4,6	10,6	26,4
HDI (Human Development Index)	0,7	0,6	0,6	0,9	0,9	0,6	0,8	0,8	0,6
Coef. Var. GDP PPP per capita	0,9	0,5	1,4	0,7	0,1	1,2	0,6	0,9	1,6
Coef. Var. Child Mortality	0,5	0,4	0,7	-	0,0	0,9	0,4	1,4	0,7

** proportion of population employed (ages 15 and older)*

Figure 24 : regionalization using the cohesion index



3.3 Regionalization using competitiveness indicator

3.3.1. Building of the competitiveness indicator

Like in the previous situation, the main difficulty here is the selection of data completed enough to be used to build a global synthetic indicator on competitiveness. The most interesting data are not available for all countries, especially for labor cost and budget of public R&D and people working in R&D. Nevertheless we choose some indicators reflecting competitiveness aspects and complete them with the same method described previously (see p. 28).

- GDP per capita that is very often used as a competitiveness indicator
- Labor force is used both as a demographic indicator but also as an employment level indicator.
- Rate of PC for 100 inhabitants. That gives an idea of the diffusion level of the high technology infrastructure.
- Rate of patents show the ability to produce innovation in research and development
- Expenses in education as a share of PIB are used to describe the investments of countries in education.

Those indicators are normalized between their respective minimum and maximum values (Figure 25) and the maps below show their spatial distribution. All of them seem roughly spatially correlated with generally relative high values in rich developed countries (European countries, Australia, North American countries and relative low values in poorest countries (Central Africa countries, India etc.). Other countries or areas (South America, Russia) appear in intermediate situations based on the indicators. The next map (Figure 26) shows the spatial repartition of the synthetic indicator. The most “competitive areas” are North America, and especially USA, North west European countries, Australia, Japan, Saudi Arabia. The discontinuity between these areas and the rest of the world is high, contrasting with the figure 22, where the social cohesion synthetic index was used.

Figure 25 : indicators included in the competitiveness synthetic indicator

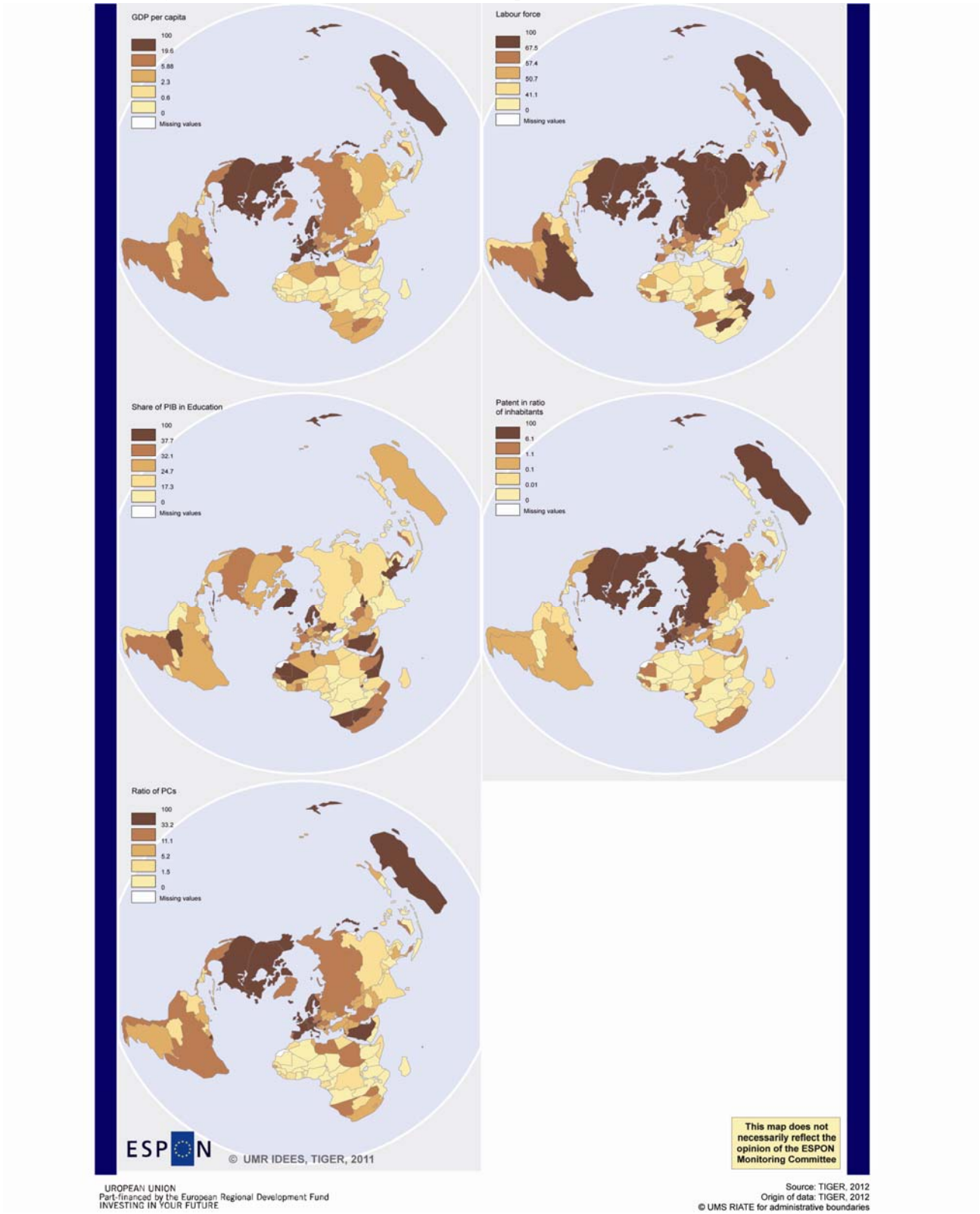
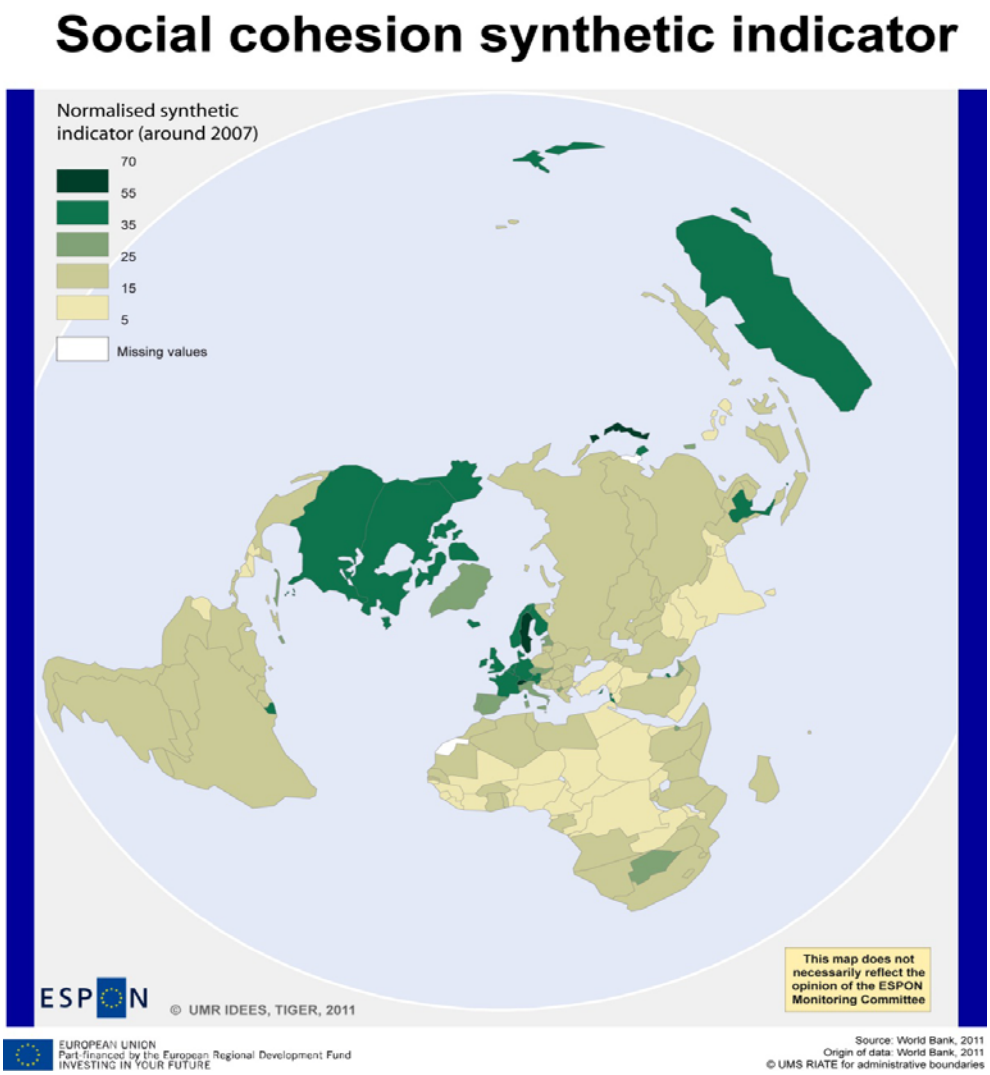


Figure 26 : the competitiveness synthetic index (2007)



3.3.2. Variation of constraints for regionalization

Like previously we explore the regions obtained using this indicator making the threshold varies in term of selection of local maximum and in term of aggregation criteria. The columns show the variation of the core threshold selection and line the variation of the aggregation criteria. We can observe that few countries of the world are able to make a core for a region and when they can, other countries have too many differences with them to aggregate. In consequence, whatever the threshold used very few countries belong to a region. This is well illustrated by the apparition of regions when the aggregation threshold is lower (Figure 27).

Figure 27 : regionalization using the competitiveness index

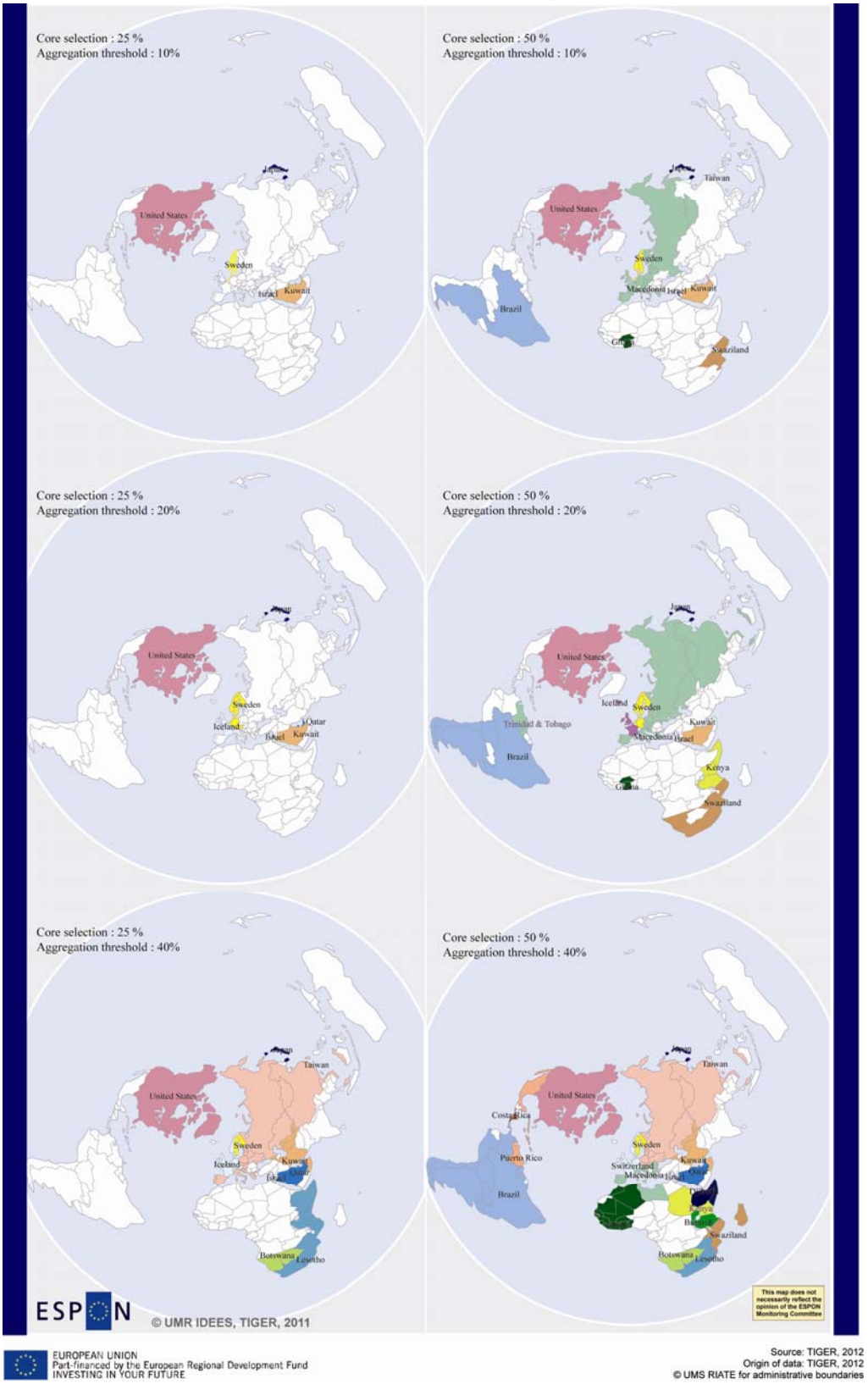


Figure 28 : values of general indicators for the regions obtained using the competitiveness synthetic indicator for regionalization

Indicator (2007)	Iceland	Israel	Japan	Kuwait	Qatar	Sweden	United States
NB of countries	4	2	2	3	2	7	2
GDP PPP (billions of US $)	5386	200	5615	534	303	5845	15372
Population (million inhabitants)	128	8	176	28	6	131	335
GDP per capita ($)	42217	25865	31872	18810	52775	44460	45920
Life expectancy (years)	80	80	81	75	77	79	80
Rate of Internet users (%)	71	43	75	30	39	81	73
Employement rate*	58,58	53,62	56,60	59,11	75,87	56,92	60,37
Child mortality (per 1000 births)	3,49	3,65	3,65	12,21	8,69	3,30	6,05
HDI (Human Development Index)	0,87	0,83	0,86	0,77	0,80	0,88	0,89
Coef. Var. GDP PPP per capita	0,15	0,06	0,27	0,40	0,22	0,29	0,05
Coef. Var. Child Mortality	0,30	0,03	0,30	0,36	0,17	0,16	0,12

** proportion of population employed (ages 15 and older)*

The number and the shape of the region vary very much according to the variation of the core selection value and aggregation threshold level, but what it is striking is a large number of countries that are not included in a region. For example if the regionalization with the core selection level at 25% and aggregation threshold at 20% , only 22 world countries are included in a region, split in 7 very small regions : the "biggest" one in term of countries gathering only 7 of them. The regions obtain in this configuration are not observed in developing area like central and south American, Africa neither Asia with the only exception of Japan. Interestingly three small regions appear in the Middle East – Arabic peninsula region organized around Israel, Kuwait and Qatar.

As far as Europe is concerned we observe that not only Europe is split in two small regions (with Iceland and Sweden as core) but also that the majority of the European countries are not included in the region formed. The situation is amplified compared to the cohesion indicator: few European countries are able to become a core and the high differences between countries on the competitiveness indicator are an obstacle to the aggregation in region. Regions whose cores are European countries, have not scored very specific compared to other world regions, for selected indicators (figure 28).

3.4 Interest, limits and perspectives of the regionalization proposed

The objective of this last part was to go beyond the « a priori » regionalization that does not allow making relevant comparison even if it can be useful in the comparison of spatial structure of indicator value variation. Different scenarios are built and tested in order to check the position of European countries in comparable world region. One main result is that often European countries are not included in the competitiveness scenarios tested here but, when they are, Europe is split in three or four parts. The deconstructive approach could be full of teaching when the application will be entirely ready and all the problems and delays evoked earlier will be solved.

- ⇨ One main limit in this regionalization method proposed is that it builds only structural regions (based on the observation of the indicators values variation) and that it does not take into account of the functional aspects (trade and financial flows, migration etc.) that are quite

important to define world regions. More the belonging to institutional regions should also be taken into account.

- ⇨ One second important problem is related to MAUP at world level. We choose to keep the national level, but doing that we allow each country to become a local maximum: Luxembourg and USA for example. Even if both have high GDP per capita, the total GDP value is quite different and the country ability to be the center of a region is different.
- ⇨ More this approach has some limits for the building of regionalization's with the aim of comparison: the number and localization of local maximum varies according each indicator (there is a priori no reason that the GDP per capita observes strictly the same spatial variation than any other variables). More, it can vary in time with the evolution of the indicators. This not makes the comparison easy.
- ⇨ But the most important problem is that it is very rare when this method allows taking into account all world countries. Most of the time a large number of countries are not included in regions that do not allow to compare all world regions.

4. Operational regionalization for comparison

One aim of this working paper is to propose a coherent world regionalization that could be operational and relevant for comparison. The two previous method explored show their limits.

- When we try to build comparable region on the European Union model it is quite impossible, because European union is much more particular in term of institutional integration that implies specific links between the countries (like regional policy), that do not exist in other regions.
- When we try to build comparable regions without any a priori model, we have to face some problem, and the most important one, as far as European Union is concerned, we are never sure to have EU member states in the same region: the maps provided show indeed (Figure 24 & Figure 27) that European Union countries are always split in two regions or even more.

We decided then to try to build a specific methodology to build comparable world regions, restricting or at least limiting the risk of splitting European countries in different regions. The choices made and the methods implemented are presented in the following section.

4.1. Method for operational regionalization

As we have stated in the methodological part of the report, some concepts are very important in regionalization contiguity and homogeneity. The previous method implemented show the importance of those aspects, but also the importance to use a method that will not exclude some countries from the regionalization obtained. In order to build comparable regions, respecting those three conditions we decided to use different simple parameters in the regionalization.

Co-belonging to economic areas

The first parameter privileged is the **co-belonging of countries in Economic integration areas**. First, as in this part of the project we do not use flows data, we decided to use those areas because, they often imply the existence of preferential trade or financial flows, or even migratory flows. More, those areas implied most of the time a high level of contiguity between the countries involved. Finally economic integration areas imply the sharing of a common project between the countries (from cooperation areas to monetary union passing by free trade zone) that mean that the regions built following this criterion could have coherence in term of effective existence. We build a table of countries where their belongings to 37 existing economic integration areas (

Figure 30) have been specified. Then, from this table, we build a matrix measuring the co-belonging of the countries to integration areas. The maximum number between two different countries is 6. That means that, for example, Egypt and Sudan or Tunisia and Libya are together in six different integration areas. As far as European countries are concerned the maximum is five. The matrix has been then normalized between 0 and 1 in order to be combined with other matrices. The minimum is 0 for the countries that belong to no integration area together (Brazil and Germany for example) or no integration area at all (Mongolia, Iran and North Korea etc.).

One main problem is that the economic integration areas do not have the same level of integration. We decided then to weight the co belonging according to the type of economic integration area. We noticed 6 types of areas the most integrated one being "economic and monetary union". We decided then to apply six levels varying from 0.17 (the lowest level) to 1 the highest level respecting the areas hierarchy. The "1" value describing the co-belonging has been replace by the following values.

- No co belonging: 0
- Association or cooperation area: 0.17
- Free trade area: 0.33
- Custom union: 0.50
- Common market: 0.67
- Economic union: 0.83
- Economic and monetary union: 1

Then, we built a final matrix with the sum of all values. We check the variation of a statistical regionalization using the both matrix (not weighted and weighted) (Figure 29) and we obtain some regions that show both some similarities and differences. For example in both cases we obtain a Europe and North Africa region even if their configuration varies slightly. The most striking

difference is the blue region on the weighted regionalization showing the emergence of a pacific region.

As the weighted matrix of co-belonging seem us to be far more satisfying for the theoretical point of view (as it takes the nature of the bilateral ties into account), we decided to use in the final next step of the analysis.

Figure 29 : co-belonging according economic integration areas

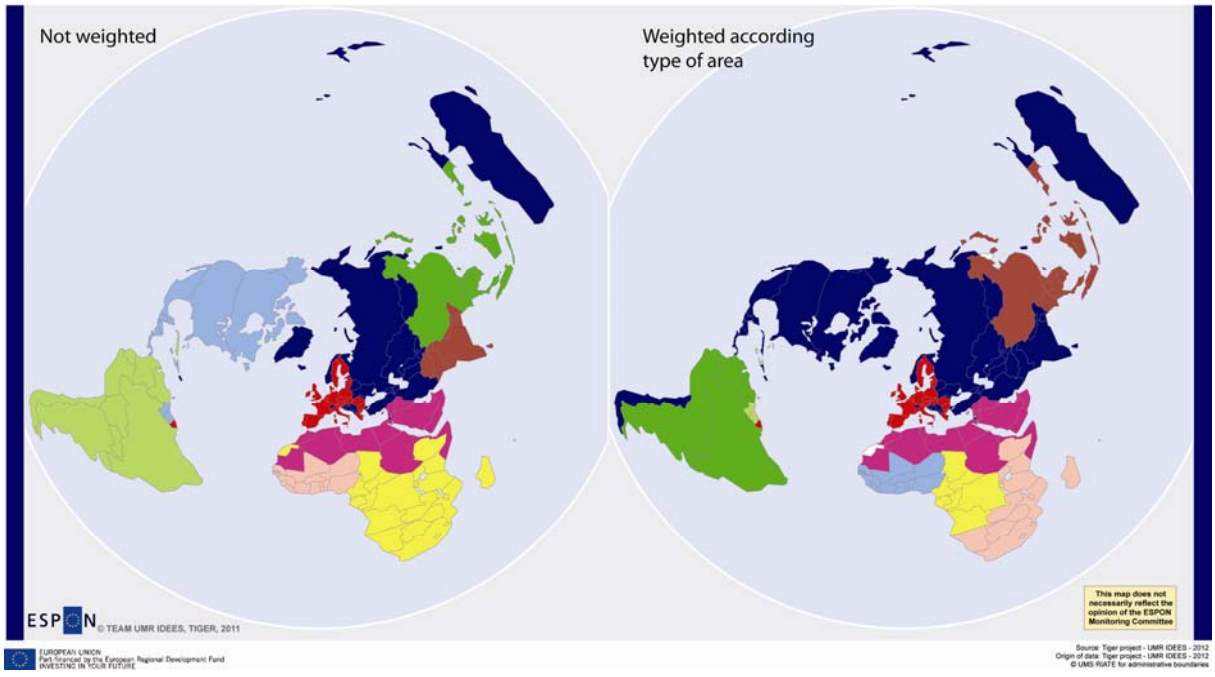


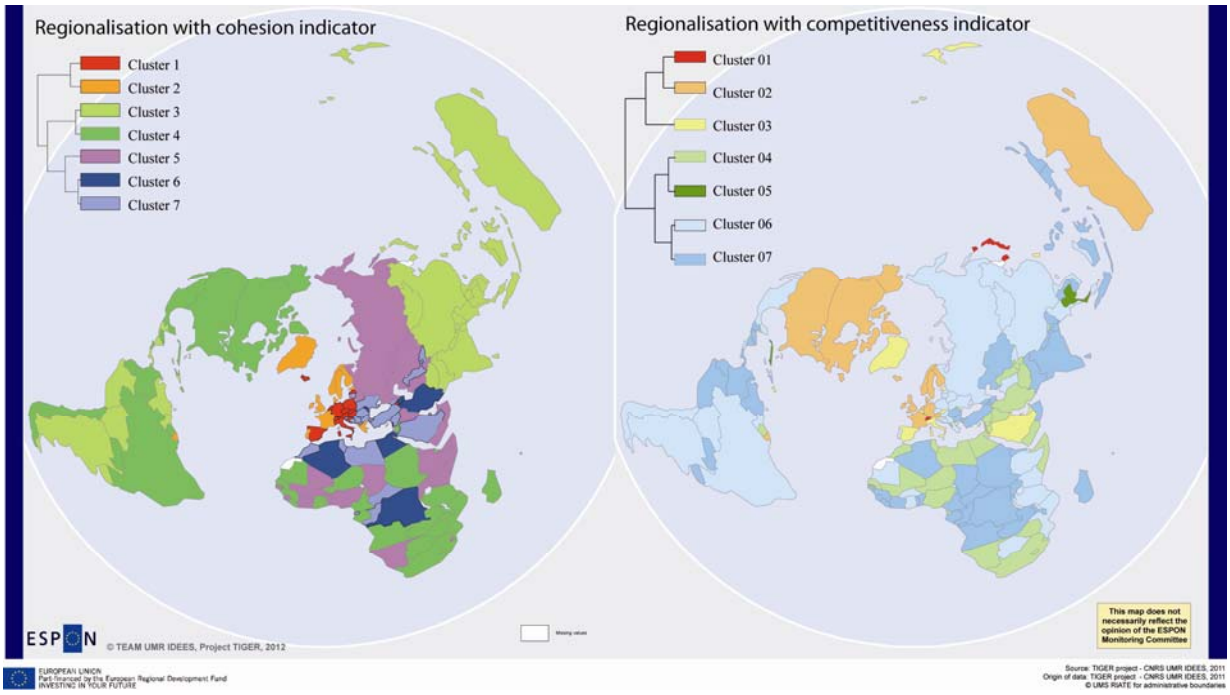
Figure 30 : table of economic integration area take into account in the building of co-belonging matrix

Acronym	Name	Date	number of			Level and kind of integration					
			members	associated	observers	1/ Association or cooperation	2/ Free trade area	3/ Custom union	4/ Common market	5/ Economic union	6/ monetary union
AL	Arab League	1945	23			yes					
ALADI	Latin American Integration Association	1980	12			yes					
AMU	Arab Maghreb Union	1989	5			yes					
ASEAN+3	Association of Southeast Asian Nations	1967	10				yes				
AU	African Union	2002	53			yes					
CAFTA	Central american free trade agreement	2003	7			yes					
CAN	Andean Community	1969	4	5	4			yes			
CARICOM	Caribbean Community	1973	15	5	8					yes	
CCASG	Cooperation Council for the Arab States of the Gulf	1981	6				yes				
CEFTA	Central European Free Trade Agreement	1992	8				yes				
CEN-SAD	Community of Sahel-Saharan States	1998	28			yes					
COMESA	Common Market for Eastern and Southern Africa	1994	20				yes				
EAC	East African community	2000	5					yes			
EAEC	Customs Union between Belarus, Kazakhstan, and Russia	2010	3					yes			
ECCAS	Economic Community of Central African States	1980	10						yes		
ECCU	Eastern carribean currency union		6								yes
ECOWAS	Economic Community of West African States	1975	15						yes		
EEE	European economic area	1994	30						yes		
EFTA	European Free Trade Association	1960	4						yes		
EUCU	European Union custom union	1996	32					yes			
EURASEC	Eurasian economic community	1996	6		3	yes					
EuroZone	Euro zone	1998	17								yes
GAFTA	Greater arab free trade area	1997	18				yes				
IGAD	Intergovernmental Authority on Development	1986	7			yes					
Israel-Palestine	Israel-Palestine custom union	1994	2			yes					
MERCOSUR	Common Southern Market	1991	5	5	2			yes			
NAFTA	North American Free Trade Agreement	1992	3				yes				
OAS	Organization of American States	1951	35			yes					
SAARC	South Asian Association for Regional Cooperation	1983	8		31	yes					
SACU	Southern african customs union	1910	5					yes			
SADC	Southern African Development Community	1992	15			yes					
SAFTA	South Asian Free Trade Area	2004	8				yes				
SICA	Central american integration system	1993	7	1	8		yes				
Swiss-Lichtenstein	Swiss-Lichtenstein custom union	1924	2					yes			
TPP	Transpacific partnership	2005	4				yes				
UE	European Union	1992	27							yes	
UNASUR	Union of South American Nations	2008	12		2	yes					

Homogeneity according both cohesion and competitiveness synthetic indicators.

The second parameter we choose to privileged is the **homogeneity parameter**. We first build two similarity matrices using the five variables gathered for the cohesion indicators in one hand and the five variables gathered for the competitiveness indicators in the other hand. Those matrices allow having a synthetic value for each couple of country describing how much they are similar or not as far as the 5 characters used are concerned. We check the configuration obtain when trying to build statistical regions with each of those indicators (Figure 31). As no contiguity constraint has been introduced we obtain some very discontinuous cluster in some cases (dark blue cluster in regionalization with cohesion indicator), but some cluster present significant level of contiguity reassuring the next part of the analysis.

Figure 31 : statistical regionalization using cohesion and competitiveness indicators



4.2. Proposal of world regionalization

Finally three matrices have used to build word regionalization. The first one describes the weighted co-belonging of couple of countries to economic integration area. The other ones provide the similarity between each country two by two both for cohesion and competitiveness synthetic indicators. The three matrices are normalized: the values of similarity and co-belonging vary between 0 and 100. The matrices have then absolutely the same format and can be used together in the next step. In order to obtain one single matrix we made the average of the three matrices.

Finally to obtain regions, we applied a hierarchical cluster analysis that builds groups of countries according their level of similarity. The observation of variance variation in the partition process allows assessing that the most significant partitions lead us to make 5 or 9 clusters). Regions are named according the classical reference to continent and to geographical direction when necessary

(North, East etc.) and in one case to an ocean. The regions obtained are mostly coherent in a spatial point of view except in some rare cases where a country is included in another region. That is the case for Thailand that appears to be included in South & East Africa region or Balkan countries that were included in Eurasia region. Those "distortion" concerns very few countries, which often emphasize their specificities, compared to their neighborhoods (Israel for example) and we decided to rearrange the region following strictly the contiguity principle: Thailand has been re-integrated to Asia region and Balkan countries to Europe region.

Figure 32 : world regions proposal

The quality of region should be tested. One solution could be to compare the intra-regional variation level compared to the world variation level. To do that the coefficient of variation of each class can be calculated and compared the world one. The table below (Figure 33) shows the value obtained for each region and each indicator used in the cohesion and competitiveness homogeneity matrices. For the majority of the region obtained the values of intra-regional disparities are lower than the disparities at the world level, (in green color) showing that level of homogeneity of those regions is rather good. It is only for few region on few indicators and few regions that the internal differences are highest than the world. It is for example the case for the ratio of patents per capita in the "Arabia

– North Africa region" or in "South and Central America". In the first region it is due to the very low level of most of country in patents per capita with the high difference of Israel and in the second one the very low level of most of country in patents per capita with the high difference of Puerto Rico and in a lower extent Bahamas. In consequence, this regionalization seems coherent and acceptable.

Figure 33 : intra region coefficient of variation compared to world one for cohesion and competitiveness indicators

Regional coef. Of Variatiov	CO2perGDP_07	Life_Expect_2007	tx_girls_07	poverty life2000-09	Lit_07-09	GDP-cap_0709	ratio-PC_0409	Patents-cap_0709	EduPIB_0509	Labourforce_0509
Arabia - North Africa	0,45	0,07	0,03	0,45	0,16	1,19	1,08	3,41	0,32	0,26
Asia	0,72	0,10	0,06	0,40	0,20	0,90	1,04	1,70	0,58	0,15
Central Africa	0,45	0,09	0,07	0,24	0,24	1,12	1,17	1,87	0,24	0,20
Eurasia	0,73	0,03	0,02	0,55	0,03	0,75	0,48	1,15	0,36	0,13
Europe	0,92	0,04	0,01	0,42	0,11	0,74	0,63	1,29	0,20	0,09
Pacific	0,44	0,02	0,01	0,55	0,02	0,31	0,15	1,03	0,23	0,03
South & central america	0,62	0,06	0,01	0,47	0,09	0,92	0,75	2,73	0,42	0,10
South and East Africa	0,89	0,12	0,07	0,36	0,20	1,27	1,07	1,30	0,44	0,12
West Africa	0,47	0,09	0,13	0,21	0,24	0,45	0,96	1,33	0,25	0,15

The fact that the regionalization obtained seems to be of rather good quality allow us to conduct some comparison between the regions. This can be done in showing the average of each indicator by region (Figure 34) or better, in calculating the standard deviation of each region to the world average (Figure 35). The average of each indicator allows assessing that the Europe region perform globally better than the other world regions. All the indicators show higher values than the world average (in red color) except for the CO2 per GDP and the number of people under the poverty line (in green).

Figure 34 : average of each region on the cohesion indicators used

Average	CO2perGDP_07	Life_Expect_2007	tx_girls_07	poverty life2000-09	Lit_07-09	GDP-cap_0709	ratio-PC_0409	Patents-cap_0709	EduPIB_0509	Labourforce_0509
Arabia - North Africa	9,70	72,38	47,64	19,93	81,74	14,94	0,16	0,25	4,38	38,92
Asia	8,70	66,24	47,30	24,75	80,17	1,85	0,04	0,07	4,36	45,38
Central Africa	2,37	49,77	46,42	53,53	69,17	3,42	0,01	0,20	2,23	40,23
Eurasia	15,75	68,68	48,06	22,02	98,68	4,56	0,07	0,46	4,79	46,91
Europe	4,38	77,62	48,49	11,86	96,69	32,44	0,38	2,62	5,21	48,96
Pacific	3,15	80,50	48,40	9,52	98,56	34,52	0,60	6,53	4,40	52,37
South & central america	5,60	72,73	48,50	37,03	89,86	7,01	0,10	0,22	4,69	43,90
South and East Africa	4,93	53,28	47,94	46,13	73,18	1,75	0,04	0,09	5,80	44,97
West Africa	4,80	54,04	44,75	54,76	47,41	0,62	0,02	0,07	4,07	40,16

The standard deviation to the global average is even more efficient to characterize the world regions obtained. The observation of the Europe region confirms the trend notice previously, even if the Pacific region, including USA, Canada, Australia, New Zealand, Japan, South Korea and Taiwan seems to perform even better except of the expenses in education. The regions where the situation seems to be the most difficult are West Africa and South and East Africa where all indicators are very lower than the global average except for the number of people under the poverty line. The situation is also difficult in Arabia – North Africa, Asia and Central Africa when it is better than previously with lowest differences with global average. Two regions are in an intermediate position Eurasia and South and Central America that are close to the global average with highest and lowest values.

Figure 35 : standard deviation to global average

Standard deviation to world average	CO2perGDP_07	Life_Expect_2007	tx_girls_07	poverty life2000-09	Lit_07-09	GDP-cap_0709	ratio-PC_0409	Patents-cap_0709	EduPIB_0509	Labourforce_0509
Arabia - North Africa	0,50	0,42	-0,03	-0,48	-0,10	0,13	-0,03	-0,28	-0,15	-0,83
Asia	0,34	-0,15	-0,16	-0,23	-0,19	-0,58	-0,56	-0,35	-0,16	0,07
Central Africa	-0,68	-1,67	-0,48	1,26	-0,78	-0,49	-0,71	-0,30	-1,28	-0,65
Eurasia	1,48	0,08	0,13	-0,37	0,81	-0,43	-0,44	-0,20	0,07	0,29
Europe	-0,36	0,91	0,29	-0,90	0,70	1,09	1,04	0,59	0,28	0,58
Pacific	-0,55	1,17	0,26	-1,02	0,80	1,20	2,07	2,04	-0,14	1,05
South & central america	-0,16	0,45	0,29	0,40	0,33	-0,30	-0,31	-0,29	0,01	-0,13
South and East Africa	-0,27	-1,35	0,08	0,87	-0,56	-0,59	-0,57	-0,34	0,60	0,02
West Africa	-0,29	-1,28	-1,10	1,32	-1,95	-0,65	-0,68	-0,35	-0,32	-0,66

General conclusion

Even if they bring to new visions of Europe in the world, the regionalizations of the world built in order to compare European Union / ESPON with other world regions show some problem and limits that are inherent to the specificity of the European Union space and integration level. What one should add or take away is less the space that the European values and particularities. One can feel that enlargements and regional policy can reduce the general competitiveness level of the European Union. But they reflect best the European values and it is difficult not to take them into account when we want to compare European Union in the world. If one wants to assume plainly the competitiveness perspective he should not look the other way and admit to countries or regions should be taken away from European Union. So European Union, ESPON region can hardly be compared to other world region. However, when we try to build world region, we can assess whatever the method employed that the position of Europe in the world, as regard to the indicator used is not as bad as we can often hear of read. When other places are considered in the same way as European Union (obligation of grouping in the building of comparable region in part 2); or possibility to disaggregate European Union (in part 3 with the building of comparable regions)) we can assess that the position of Europe/ESPON region is quite comfortable in a world perspective both on cohesion and competitiveness perspective.

The operational world regionalization proposes new coherent operating divisions of the world (with nine regions) which combine homogeneity according both cohesion and competitiveness synthetic indicators and co-belonging of countries in Economic integration areas.

But one should also ask why we need to pit this particular object that is European Union against other non-relevant objects (countries, regions) with to non-relevant indicators for lack of anything better. This position is surely a sclerosing one and European Union should assume its own model combining cohesion (that give it its meaning) and competitiveness (that allow to support cohesion) and build its own indicators to evaluate its own performances and the performances of other parts of the world compared to it.

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