ESPON

INTERCO
Indicators of territorial cohesion

Scientific Platform and Tools Project 2013/3/2

Final Report

Part C | Scientific report

EUROPEAN UNION
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C.1. Territorial cohesion

Territorial cohesion is a multi-dimensional and dynamic concept, prone to different interpretations. Taking its roots in spatial policy development, it has aroused the interest of several actors, from researcher to policy makers and planners. For a long time, debates on what was called European *space* or *territory*, *spatial* or *territorial* dimension, took place in informal meetings or under the auspices of Council of Europe. Important documents punctuate the emergence of territorial issue, such as Europe 2000 and 2000+, the Leipzig Charter, the European Spatial Development Perspectives (ESDP), the Territorial States and Perspectives of the European Union (TSP, 2005) and of course the Territorial Agenda (TA) of 2007 which started to spread the topic out of specialists' spheres. But the public debate was really launched by the Green Paper on Territorial Cohesion (EC, 2008a), which reminds the main issues related to territorial cohesion: harmonious development of all territories and of European territory, competitiveness, territorial diversity and potential, accessibility, cooperation, inclusion, sustainability and coordination of policies.

Although it took over previous insights on territorial cohesion, it did not propose any clear definition of it but had a wide and integrated approach, with balanced and sustainable development at its centre. Territorial cohesion is seen as a means of achieving it, by transforming diversity into an asset. The key challenge identified is "*to ensure a balanced and sustainable territorial development of the EU as whole, strengthening its economic competitiveness and capacity for growth while respecting the need to preserve its natural assets and ensuring social cohesion*". Thus, territorial cohesion has the difficult task to build "*bridges between economic effectiveness, social cohesion and ecological balance*". This threefold dimension is partly due to its close links with sustainable development. It also reflects the different not to say contradictory development paradigms it tries to harmonise, such as sustainability, convergence and regional competitiveness (TSP, 2011). One has to go back to territorial cohesion genealogy to understand how we came to this.

Officially territorial cohesion was first mentioned in European primary law in 1997, when new Treaty establishing the European Community (TEC) after the reform of Amsterdam discreetly introduced the terms. Article 16 (now article 14 TFEU) recognised "the place occupied by services of general economic interest in the shared values of the Union as well as their role in promoting social and territorial cohesion". This aspect of territorial cohesion is very specific in comparison to the broader sense it has gained later. The link between general economic interest services provision and territorial cohesion is the idea that every territory must be included in overall European development, having the same opportunities thanks to basic infrastructures tailored to its territorial context and without leaving aside specific territories (Husson, 2002). It can be seen as a need for "spatial justice" (Dabinett, 2011) in the context of a European model of society that should be preserve (Davoudi, 2007). One can recognise here the then French vision which advocates for provision of even non profitable services in all parts of territory (Peyrony, 2007). It is

not surprising, knowing that the Assembly of European Regions first claimed for introducing this third pillar of cohesion in 1995, after having observed that solidarity was strongly missing among European territories and that unbalanced development may lead to territorial deconstruction (AER, 1995). These “French roots” played a great role in understanding and promoting territorial cohesion as maintaining services and lifestyle in less favoured regions, to counter balance deregulation (Faludi, 2004). Besides, French institutions are still priding themselves on it (DATAR 2010) after the success of what has become a “not-so-new buzz word” (Eser, 2009).

Territorial cohesion as an objective of the EU is much more recent since it was added thanks to the Lisbon reform (article 3 TEU: the Union “shall promote economic, social and territorial cohesion, and solidarity among Member States”). As such it does not tell us much about how to achieve territorial cohesion nor about what it means. But the related part on economic, social and territorial cohesion (Title XVIII) has some important changes. According to what had been proposed in the Treaty establishing a Constitution for Europe (article III-220), the least favoured regions which deserve more attention are not anymore only islands or rural areas (ex article 158 TEC). Indeed, the new article on cohesion states that:

> *“In order to promote its overall harmonious development, the Union shall develop and pursue its actions leading to the strengthening of its economic, social and territorial cohesion.*
>
> *In particular, the Union shall aim at reducing disparities between the levels of development of the various regions and the backwardness of the least favoured regions.*
>
> *Among the regions concerned, particular attention shall be paid to rural areas, areas affected by industrial transition, and regions which suffer from severe and permanent natural or demographic handicaps such as the northernmost regions with very low population density and island, cross- border and mountain regions.”* (article 174 TFEU)

The new treaties recognise the role of territorial cohesion to achieve harmonious, balanced and sustainable development, translating it into a territorial setting (TSP, 2011). They take over the idea of reducing disparities, which is the main goal of Cohesion policy, and specify on which new areas public actions have to focus, leaving the door open for new types of regions. As such, territorial cohesion appears as a twofold concept (Schön, 2005). First, it aims at decreasing gaps of socio-economic development levels, to promote equity and balance. And not only between member states but also between regions, where disparities are increasing, and more generally between “territories”, were they cities, rural or functional areas. This has raised the question of efficiency of Cohesion policy (Ederveen, Gorter 2002) while studies have demonstrated that disparities tend to increase at regional scale (Geppert, Stephan, 2008 ; Jean, Baudelle, (dir.), 2009 ; EC, 2008a; Dubois et al. 2007). Nevertheless, this situation confirms the need of a “place-based” approach (Barca, 2009) in policy making and policy evaluation. Second, in order to reduce

negative effects of geographical and structural features that are considered as obstacles to good interaction between those specific territories and other regions, an efficient use of territorial capital is expected to transform handicaps into assets, or "diversity into a strength". The idea behind is that unused growth potential can reinforce persistent disparities (OECD, 2009) and that comparative advantages can result from specific features and act as development potentials. Unleashing the territorial capital (EC/DG Regio, 2009c) does not only concern local development, although it has become central in new Cohesion policy, but rather endogenous development.

As the focus is on territories and not on sectors, implementing territorial cohesion requires coordination of economic policies of Member States as well as of sectoral policies and actions of the EU. This is expressed by article 175 TFEU, which tries to overcome the difficulty of overlapping powers and competence in the field of spatial development policies, because they are implemented by different actors. Thus, at European level, the challenge is to internalise spatial mindset among officials and to encourage responsible spatial policy authorities to play their role in implementing territorial cohesion (Bynens, Van der Lecq, 2005). The fact that territorial cohesion is now a shared competence does not really solve the problem already stressed by ESDP. As a policy framework, ESDP aimed at improving "cooperation between Community sectoral policies with significant spatial impacts and between Member States, their regions and cities" (ESDP, par. 22). Among its principles, it stated that spatial development can contribute in a decisive way to the achievement of the goal of economic and social cohesion, to the implementation of Community policies which have a territorial impact and that the central aim is to achieve sustainable and balanced development. In that context, territorial cohesion is becoming a more governance issue and takes over the role of spatial development policy in the post-ESDP-process (David, 2007). But this need for more coherence should not reduce territorial cohesion to the territorial dimension which must be taken into account in policy process, for example through territorial impact assessments and more generally through appropriate tools that helping defining territorial context, challenges and policy answers (McCann, 2011).

Because of its genealogy, territorial cohesion can be considered as a policy concept, rather than a theoretical concept (Gualini, 2008). This may be the reason why it encompasses such divergent goals, coming almost all from ESDP. Indeed, this first political document gathering knowledge and orientations for European space set up all important issues that are still at stake in new Territorial Agenda. The three spatial development guidelines are:

- Development of a polycentric and balanced urban system and strengthening of the partnership between urban and rural areas. This involves overcoming the outdated dualism between city and countryside.
- Promotion of integrated transport and communication concepts, which support the polycentric development of the EU territory and are an important

pre-condition for enabling European cities and regions to pursue their integration into EMU. Parity of access to infrastructure and knowledge should be realised gradually. Regionally adapted solutions must be found for this.

- Development and conservation of the natural and the cultural heritage through wise management. This contributes both to the preservation and deepening of regional identities and the maintenance of the natural and cultural diversity of the regions and cities of the EU in the age of globalisation.

Actually, polycentrism appears as an overarching principle which has free itself from urban studies and became a normative concept (Davoudi, 2003 ; Gualini, 2008). Far from being only about territorial structure, its decentralised centrality concerns at least four scales: European, national, regional and local (Baudelle, Castagnède, 2002). They are well taken into account in TA 2020, but it may be preferable to make clear the objective for each level (Krätke, 2001), since it appears that for regions and cities it is more related to competitiveness issues, whereas for the EU it is discussed in terms of cohesion and in both competitiveness and cohesion at national scale (Meijers, Waterhout, Zonneveld, 2006). This raises the broader question of compatibility between cohesion and competitiveness (Lennert, Robert 2010, Héraud, 2009; Vanolo 2010 ; Ache, 2008), especially with technological innovation and cluster being at the centre of development strategy (Héraud, 2009). In any case, the role of cities is crucial for a polycentric Europe, as they constitute nodes of concentration and connection. Urban dimension gains more and more importance in Cohesion policy (EC, 2011c) and in Europe's growth strategy (EC, 2011b). This is not surprising knowing that from small towns to large urban areas, cities contain the biggest contradictions and concentrate the highest disparities, which increase the challenges they have to face.

As we can see, there are different ways of understanding territorial cohesion, given its background and its multiple objectives. Following Camagni, we can summarise the three dimensions as below (Camagni et al., 2010- TIPTAP Final Report):

- Territorial Efficiency: resource-efficiency with respect to energy, land and natural resources; competitiveness and attractiveness; internal and external accessibility; capacity of resistance against de-structuring forces related to the globalisation process; territorial integration and cooperation between regions;
- Territorial Quality: the quality of the living and working environment; comparable living standards across territories; fair access to services of general interest and to knowledge;
- Territorial Identity: presence of "social capital"; landscape and cultural heritage; creativity; local know-how and specificities; productive "vocations" and "uniqueness" of each territory.

This vision deserves credit for integrating economic, social and environmental objectives, but in fact it reproduces the ambiguity of a "model that maximizes economic growth through competitiveness softened by references to ecological

equilibrium" (Farrugia, Gallina, 2008). This can be explained by EU's current policy priorities to which it is linked. To take only the most important, we should refer to Europe 2020 and Sustainable Development strategies. The first aims at smart, sustainable and inclusive growth : developing an economy based on knowledge and innovation, focusing on more resource efficient, greener and more competitive economy and fostering a high-employment economy delivering economic, social and territorial cohesion (EC, 2010a). Thus, the relationship between territorial policy and growth strategy has to be mutual (TSP, 2011). The second, as a long-term and global vision, includes territorial cohesion in the overarching questions of well-being and progress, i.e. an economic and social well-being that is sustainable.

Behind the territorial dimension, this is actually the overarching question of **well-being** of people that is at stake, even more the question of **progress**, i.e. an economic and social well-being that is sustainable (see the work of the Commission on the Measurement of Economic Performance and Social Progress Following (Stiglitz, Sen and Fitoussi 2009)).

There are indeed clear links between territorial cohesion, well-being (economic, social, environmental) and sustainability. Well-being must be sustainable in the long term and shared among people and territories; cohesion is a condition for sustainability; sustainability must be looked after while maintaining the highest possible level of well being (Figure 13).

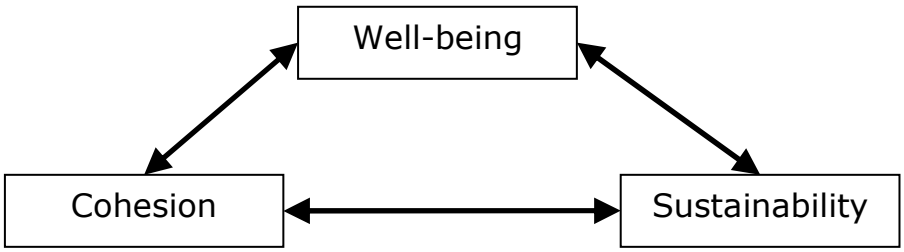


Figure 13. Cohesion, well-being and sustainability

Sustainability could be seen as the temporal component of well-being, cohesion being an horizontal component across the various dimensions of well-being (economy, society, environment). In reference to Da Cunha (Da Cunha, 2005) for his definition of sustainable development, cohesion can be seen as:

- a principle of action (something must be done)
- ethics (a set of values, such as economical, social and territorial equity)
- an integrative concept (multi-dimensional approach)

Linking territorial cohesion with well-being may appear well-intentioned, but in fact it is crucial when it comes to measure it, i.e. to choose indicators and ways of calculating them. To measure the dimension of well-being on which policy can reasonably claim to have an effect, we have to prefer outcomes indicators (Barca, McCann, 2011). This allows also getting out of the false debate on place-based *vs* people-centred policies.

Territorial cohesion, being an objective and an instrument, is a rather complex policy concept, evolving with the general policy context and much prone to debate. Even if a clear definition is desirable, one has to admit that its flexibility allow many interpretations and thus adaptations to different contexts. This may not make the task to implement and measure it easier, but its different facets give also more possibilities for the choice of indicators.

C.2. Indicator selection and calculation

C.2.1. The selection of the "headline" and "core" indicators

C.2.1.1. The number of indicators

As we have underlined, **the number of these indicators should not be very big** in order the entire set could be easily handled by interested stakeholders. The project first identified roughly 60 headlines and core indicators (Annex 2) and, finally, 32 top indicators (Annex 3).

C.2.1.2. "Territorial" or "place- based" indicators

A primary important criterion of selection of indicators is **whether they are "territorial" or "place- based"**. This criterion has both conceptual and "technical" aspects.

The conceptual aspect

INTERCO has prioritised a "**place-based" or "territorial" approach of the ESPON space.** As a number of analyses has stressed (see, among others, in: Barca 2011 and Grasland, Hamez 2005), the setting and implementation of the EU Cohesion policy were at a great extent based on a "a-spatial" (non spatial) approach of Cohesion. Thus the attempts of the Cohesion policy to face the actual territorial challenges were much less efficient than expected.

The "territorial" scope of INTERCO should be reflected both in the choice of the indicators and the methods to use them.

From this point of view the literature on the "place based'' approaches does not always define clearly the issues which are supposed to be "territorial". However, all the respective researches agree that issues related to the cities, the rural space and the specific regions are more "territorial' than the issues related to a simpler "regional classification" of the European and the national space.

The technical aspect

From the previously described scope, indicators which correspond to the NUTS 3 level and, even lower levels –LAU levels– are more "territorial" than others. The "degree of urbanisation" also counts from this scope. We will come back to this issue in next.

C.2.1.3. The cover of all the TC dimensions

An important choice of INTERCO is to approach TC as a **multi-dimensional concept**, emphasising, more than the relevant previous attempts, on the well-being and environment components of TC.

INTERCO has approached the TC dimensions in **two conceptual levels** (see also in chapter "B.2.1. Selecting the indicators"):

A more general level in which TC is analysed in three dimensions: economy (competitiveness), society (inclusion), environment or, in terms of the "Europe 2020": *smart growth, inclusive development, sustainable development* (environmental sustainability).

A second level in which TC is decomposed in eight dimensions: *competitiveness, innovation, inclusion, environment quality, energy, connection and cooperation/ governance.*

C.2.1.4. The data availability in relation to the scale/level and the context

Scales and contexts

The territorial approach is necessarily a **multi-level** approach in which drivers of force acting at each level are interrelated with drivers of force acting at the higher and lower levels. Thus, the **"context"** is of crucial importance for the territorial approach of cohesion. Therefore it was necessary to examine if the headline and core indicators enable to study this interaction among the "levels".

Specifically, the tests of indicators in INTERCO showed that the territorial patterns of inequalities per indicator differ considerably according to the level examined.

Therefore we have included by priority in the "headline and core" set indicators for which there are data at least for the NUTS 2 level. This concerns finally the large majority of indicators of this set.

The existence of data at NUTS 3 level is an advantage, but working for some "dimensions" at NUTS 3 level necessitates the transformation of the NUTS 2 data for other indicators to NUTS 3, which could be done with caution.

The data availability per NUTS

From the scope of the present analysis, we have discerned four categories of indicators as for the data availability:

- **Indicators for which there are actually data only at NUTS 0 level** (for example: Labour productivity.) It is not worthwhile to use these indicators in synthetic/composite indicators which aim explain territorial inequalities (adopting a place-based approach). INTERCO recommends to Eurostat and EU Member States to collect the respective data regularly at NUTS 2 level.
- **Indicators for which there are actually data at NUTS 2 level**. They could be used for the creation of TC synthetic/composite indicators. We should divide this group of indicators in two sub-categories:
    a. The first refers to indicators the data for which are already collected regularly by National Statistical Offices as for example labour force indicators based on data collected by the Labour Force surveys which are regularly implemented in all EU countries.
    b. Indicators based on data provided by specific surveys which are not implemented regularly by National Statistical Offices of the EU

countries as for example: GERD (Gross domestic expenditure on research and development). INTERCO recommends to Eurostat and EU countries to collect the respective data regularly (at NUTS 2 level).

- **Indicators for which there are data at NUTS 3 level** as for example: employment rate. These indicators are the more appropriate to be used in TC analyses and for the creation of TC synthetic/composite indicators for all the TC issues except from the TC urban-rural and "local" issues.
- **Indicators for which there are data at LAU level** as for example: population density. They are more appropriate to study the TC urban-rural and local issues.

  Approaches of some dimensions of TC could only be implemented by analyses at LAU level: urban, urban-rural and "local" analyses (included in the "territorial structure" dimension) or by network analyses (included in the "connection" dimension).

*As we have pointed out the set of "headline" and "core" indicators (*Annex 2*) fulfills to a considerable degree but not fully the selection criteria.*

The indicators which fulfil fully these criteria are included in the list of "top" indicators while the remaining indicators are put in a ***list of "wishful" indicators.***

C.2.2. The selection of top indicators

The number of indicators of this set is even more limited – it contains 32 indicators (Table 6, page 19) – in order that this set could be used by a very large audience of interested stakeholders, a number of which has a low technical capacity regarding TC concepts and techniques.

The top indicators should be fully "territorial", fully operational actually (the necessary data should be available now -see before) and very well related to territorial cohesion policy objectives.

Especially for this last criterion:

The majority of the **Territorial Agenda 2020** objectives (see below), which interests INTERCO more as they are by definition based in a space-based approach, correspond to the top indicators. The latter should also correspond to the EU 2020 priorities.

TA 2020 priorities

- Promote polycentric and balanced territorial development
- Encouraging integrated development in cities, rural and specific regions
- Territorial integration in cross-border and transnational functional regions
- Ensuring global competitiveness of the regions based on strong local economies
- Improving territorial connectivity for individuals, communities and enterprises

- Managing and connecting ecological, landscape and cultural values of regions

EU 2020 priorities

- Smart growth – developing an economy based on knowledge and innovation
- Sustainable growth – promoting a more resource efficient, greener and more competitive economy
- Inclusive growth – fostering a high-employment economy delivering economic, social and territorial cohesion

The TPG has assessed in more depth the degree of fulfillment of these criteria using the following more detailed **additional criteria** for the indicators examined[7]:

- They clearly target territorial cohesion and not economic or social cohesion, i.e. they focus on the added value of territorial cohesion
- They are normative, i.e. they move from less to more territorial cohesion.
- The direction of change should be clear.
- Exact thresholds could be used. These thresholds should be decided through a political process but should also be related at least to the thresholds mentioned by the EU 2020 targets[8].
- Necessary data for the indicators are available, updated regularly -ideally annually- and include a short time series
- They change over time
- They are sensitive to policy change
- They are available at the sub-national level and preferably NUTS 3 or degree of urbanisation + NUTS 2 level
- As territorial cohesion mostly relates to differences between territories, not on the absolute values of an indicator within a single region. The direction of change should be to reduce differences between regions/territories and not a general increase everywhere

Almost all the “top” indicators (Table 6) fulfill these additional criteria.

[7] The majority of these criteria are included in the contribution of L. Disjkra (DG Regio) towards the 2nd INTERCO meeting with stakeholders.

[8] The 5 targets for the EU 2020:
1. Employment: 75% of the 20-64 year-olds to be employed
2. R&D/innovation: 3% of the EU's GDP (public and private combined) to be invested in R&D/innovation
3. Climate change/energy: greenhouse gas emissions 20% (or even 30%, if the conditions are right)lower than 1990,
20% of energy from renewables, 20% increase in energy efficiency
4. Education: Reducing school drop-out rates below 10%, at least 40% of 30-34–year-olds completing third level education
5. Poverty/social exclusion: at least 20 million fewer people in or at risk of poverty and social exclusion

C.2.3. Calculation of the indicators

C.2.3.1. Data compilation

The first step is to compile the data available from various sources and formats in a way that allows for futher calculation and mapping of the indicators. Table 9 shows the example of data on gender imbalance (ratio female to male x 100) available at NUTS 3 level, but not for all the 1'351 NUTS 3 entities (as defined in 2006) and all years :

NUTS code	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Time span	State	Growth rate
AT111			105.6	105.6	105.6	103.8	104.4	104.4	104.4	104.9		2003-2008	104.4	-0.19
AT112			104.3	105.8	104.3	104.7	104.5	104.3	104.3	104.4		2003-2008	104.3	-0.23
...														
DE111				103.5	103.4	102.9	102.7	102.6	102.3	102		2003-2008	102.3	-0.19
DE112				101.6	102.2	102	102.1	102.1	102.2	102.3		2003-2008	102.2	0.09
...														
FR101	113.0	112.8	112.7	112.4	112.2	112.3	112.3	112.2	112.0			2003-2008	112.0	-0.06
FR102	103.2	103.3	103.6	103.8	104.1	104.1	104.1	104.1	104.3			2003-2008	104.3	0.09

Table 9. Example of a data table (gender imbalance)

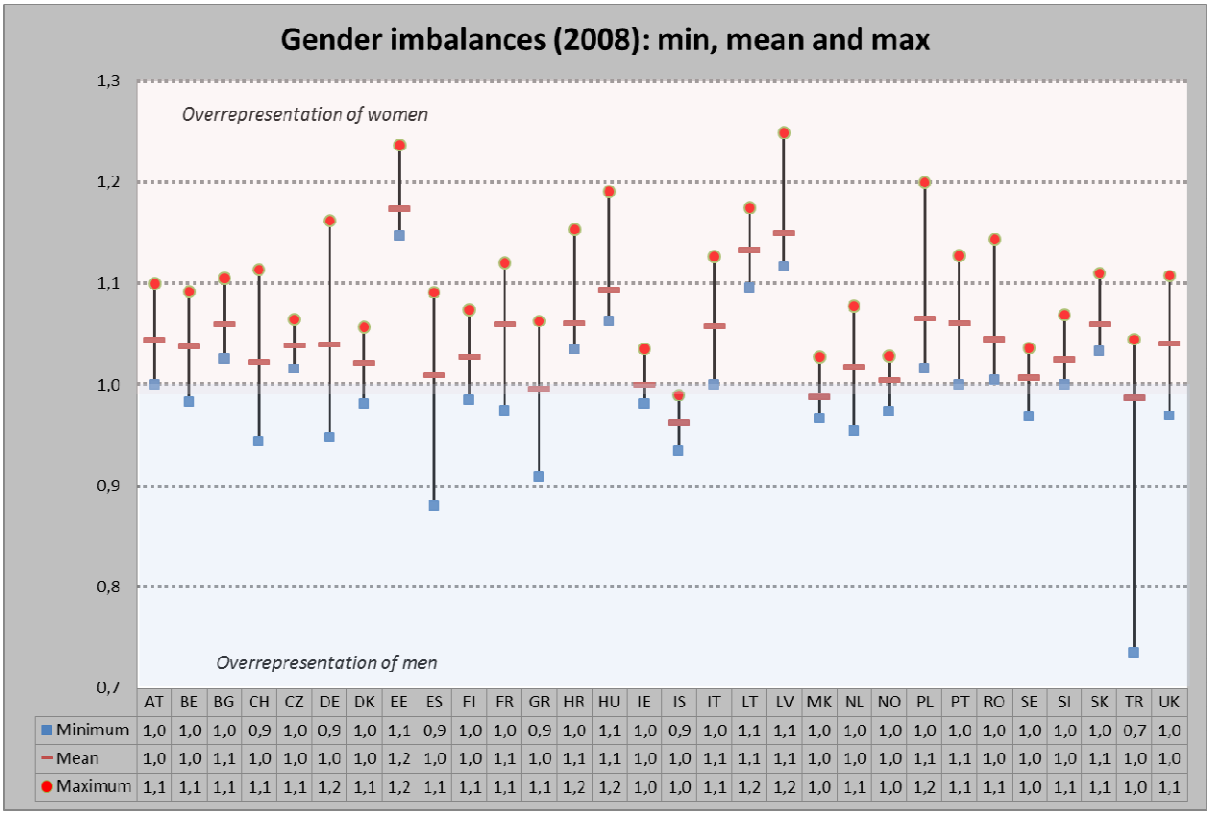
A reference time span was defined by looking at the years for which data were provided for most of the NUTS 3 regions. In the case of gender imbalance, it was for the period 2003-2008 (920 figures). Subsequently, a **state value** was defined as the value of the most recent year of the reference period (2008 in the above example) and an **annual growth rate** was calculated as follows:

$$Growth\_rate = \frac{\frac{(y_{t1} - y_{t0})}{y_{t0}} * 100}{N}$$

where y_{t1} and y_{t0} are respectively the value at the end and the beginning of the reference period and N the number of years of the period.

C.2.3.2. Calculation of simple statistical indicators

Some classic, relatively simple statistical functions such as **minimum**, **maximum**, **mean**, **standard deviation** values were used to measure territorial inequalities. These statistical indicators give a first picture of disparities among regions at different territorial levels - EU as a whole, by country (see example Figure 14), but also by any kind of possible typology including the degrees of urbanisation or the regional typologies of the 5th Cohesion Report.



	AT	BE	BG	CH	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU	IE	IS	IT	LT	LV	MK	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
Minimum	1,0	1,0	1,0	0,9	1,0	0,9	1,0	1,1	0,9	1,0	1,0	0,9	1,0	1,1	1,0	0,9	1,0	1,1	1,1	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	0,7	1,0
Mean	1,0	1,0	1,1	1,0	1,0	1,0	1,0	1,2	1,0	1,0	1,1	1,0	1,1	1,1	1,0	1,0	1,1	1,1	1,1	1,0	1,0	1,0	1,1	1,1	1,0	1,0	1,0	1,1	1,0	1,0
Maximum	1,1	1,1	1,1	1,1	1,1	1,2	1,1	1,2	1,1	1,1	1,1	1,1	1,2	1,2	1,0	1,0	1,1	1,2	1,2	1,0	1,1	1,0	1,2	1,1	1,1	1,0	1,1	1,1	1,0	1,1

Figure 14. Example of simple statistical indicators (NUTS 3 values by country : minimum, maximum, mean)

C.2.3.3 Calculation of sigma and beta convergence

Sigma and beta convergence indicators were used to further analyse disparities between territories (and their evolution). The ideas of sigma and beta convergence, developed in the economical field (Barro and Sala-i-Martin 1992, Sala-i-Martin 1996) are well summarised by Monfort (2008):

"While Beta-convergence focuses on detecting possible catching-up processes, Sigma-convergence simply refers to a reduction of disparities among regions in time. The two concepts are of course closely related. Formally, Beta-convergence is necessary but not sufficient for Sigma-convergence."

In other words, if disparities between territories fall over time, there is sigma convergence. If territories lagging behind (as compared to other ones or to target values) are progressing faster than those more advanced, there is beta convergence.

Sigma convergence

For measuring disparities, we used the following formula:

$$stdev\_avg = \frac{\sigma}{\mu}$$

where σ is the standard deviation of values within a given space of reference (EU, country, type of region) and μ the mean of the same values. Normalising the

standard deviation by the mean allows for comparisons through time (changes in mean values are taken into account) and between variables having different measurement units.

Many alternative indicators of disparities could be considered, such as the Gini index, but the normalised standard deviation was selected for its simplicity of computation and interpretation.

We calculated the normalised standard deviation for each available year and the resulting time series could be plotted in graphs such as in Figure 15.

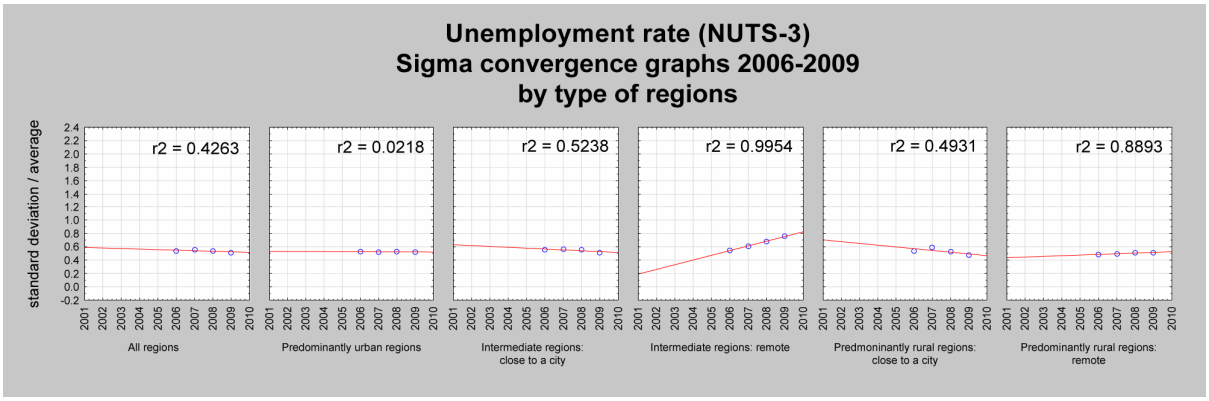


Figure 15. Example of sigma convergence graphs

A linear regression analysis was performed on each graph. The coefficients of correlation *r* provides an information on the evolution of the disparities: a negative correlation indicates a reduction of disparities, hence a sigma convergence. The coefficient of determination r^2 provides an information on the strength of the tendency (be it negative or positive). A low r^2 means that no clear tendency can be confirmed. The slope of the regression line indicates the speed of change in disparities (the steeper the slope, the faster the evolution of disparities).

Beta convergence

In order to analyse the possible catching-up processes, we plotted the state and growth values of the territories (as defined earlier in page 11, see Table 9), for the entire EU and possibly by type of region if NUTS 3 data were available (Figure 16).

As for the sigma convergence plots, regression lines were computed. Coefficients of correlation *r* and determination r^2 were calculated. A negative *r* value indicates a catching-up process, hence a potentially positive effect on the reduction of disparities. Conversely, a positive correlation value is an indication of increasing disparities. The slope of the regression line indicates the speed of the catching-up process (the steeper the negative slope, the stronger the catching-up process). As for the sigma convergence, the coefficient of determination r^2 provides an indication on the goodness of fit of the relation between the two variables, hence the possibility to interpret a convergence/divergence trend.

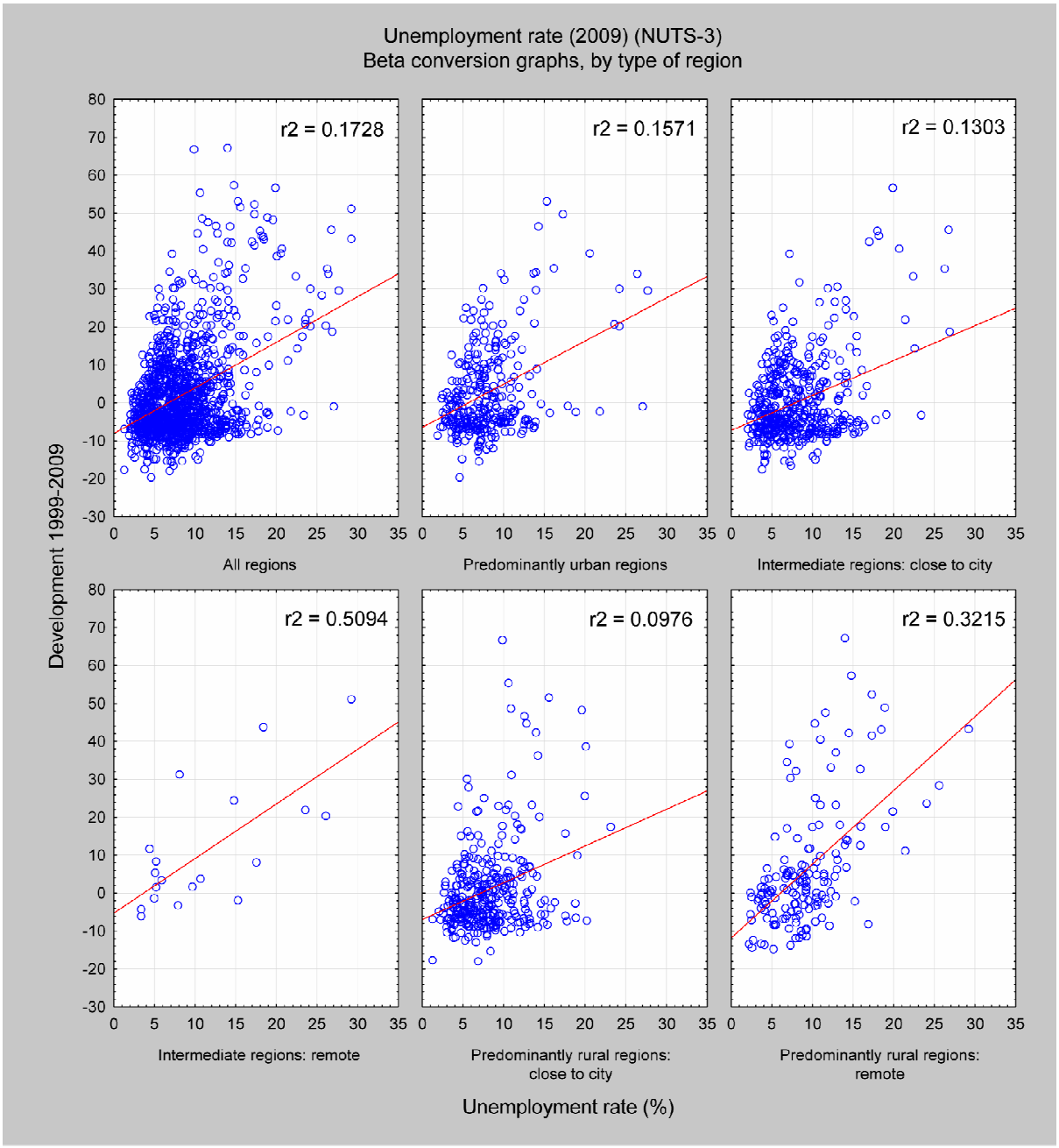


Figure 16. Example of beta convergence graphs

The graphs in Figure 16 do not show clear trend (low r^2) except for the "Intermediate regions: remote" for which a somehow more evident trend toward divergence can be observed.

C.2.3.4 Synthetic representations

We have also been exploring possible ways of presenting the main results, knowing that we are not only looking at the states and trends of each indicator, but even more at the performances in terms of convergence, i.e. of the evolution of disparities among European territories.

Results can be presented in many different ways (tables, maps, graphs) however, simple and comprehensive graphs are required for better communication in policy contexts.

We present below first few tries of such synthetic representations that could be developed, if sufficient spatial resolution and time series are available for the entire European territory.

Star diagram of disparities

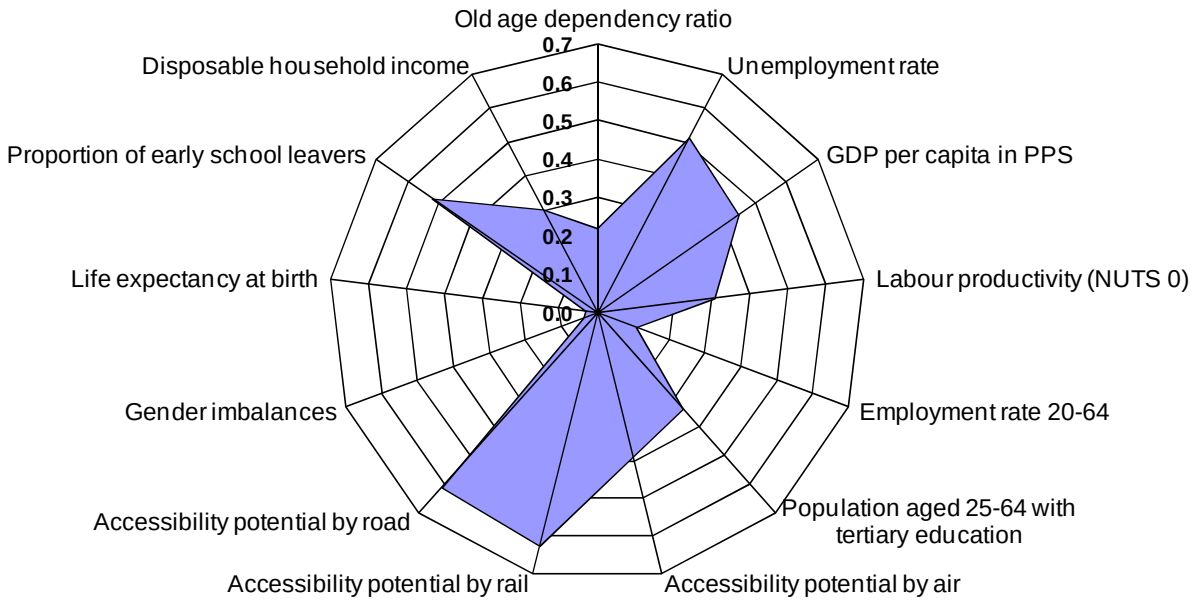


Figure 17. Disparities (standard deviation / average)

Figure 17 shows at one glance disparities for each indicator. If spatial (NUTS) levels and reference years were the same for all indicators, synthetic graphs could be produced as shown above, showing the objectives that are still challenging in terms of disparities. For instance, we can note that the most problematic issues are the accessibility by road and by rail, meaning that some place are still lagging behind in terms of access to jobs and markets. Proportion of early school leavers and unemployment rate are also important challenges to look at for political objectives. The star diagram has the advantage to represent in a simple way all indicators and how they behave one compared to each other.

Bar chart of sigma convergences

We could also present the results of the project with another kind of graph displaying sigma convergence values, in this case the correlation *r* between the levels of disparities and time (Figure 18).

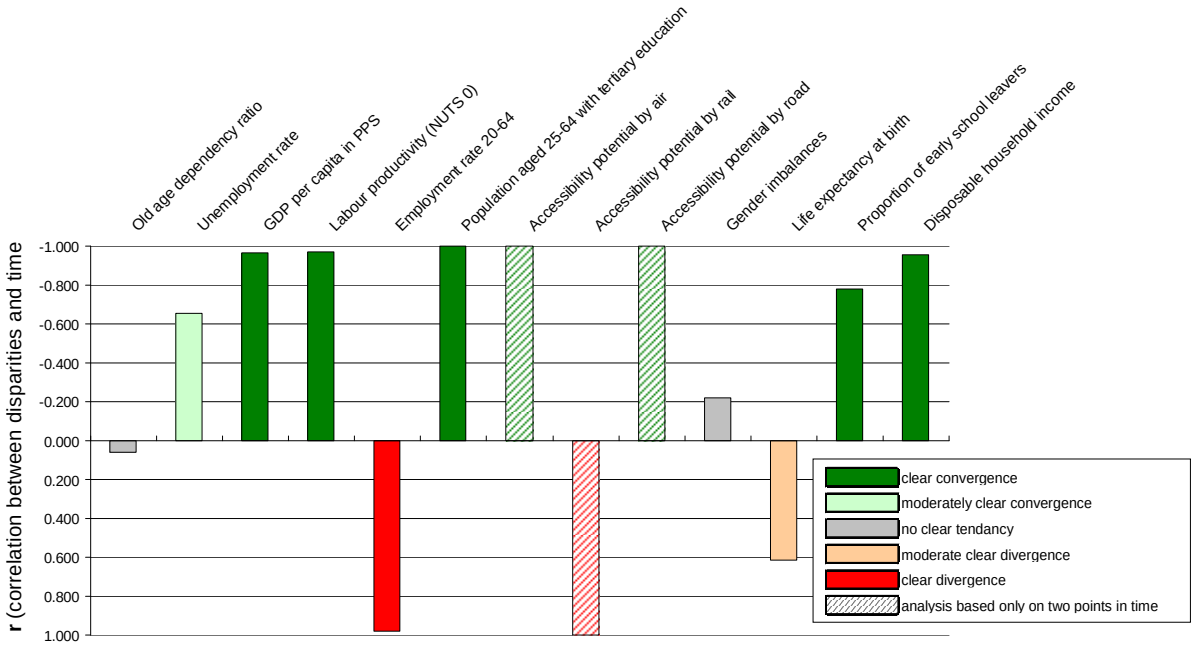


Figure 18. Bar chart of sigma convergences

A high correlation (e.g. below -0.75 or above +0.75) indicates that there is a clear tendency to the reduction or increase of disparities. A low correlation (e.g. between -0.25 and +0.25) indicates that disparities might diminish in one period and then increase again, in a random manner. It must be noted that correlation does not tell anything about the speed of reduction.

We can note that a few indicators presents clear convergence such as GDP/capita, labour productivity, population aged 25-64 with tertiary education, and disposable household income (again convergence can be clear but slow, such as for GDP/capita; information on the speed of convergence is not visible on this graph). Employment has a clear tendency of increasing divergence through time.

Indicators on accessibility potential by air, rail and road are shown with oblique patterns because data on only two points in time were available, hence correlations of -1 or +1 are not significant. Nevertheless, displaying this figures might help raising again the question of data availability.

The star diagrams by territorial objectives

The disparities among territories in Europe could also be exerted in comparison with the other elements that are building a given territorial objective. In the next diagram (Figure 19) are displayed the disparities for the indicators of the territorial objective "Inclusion and quality of life" :

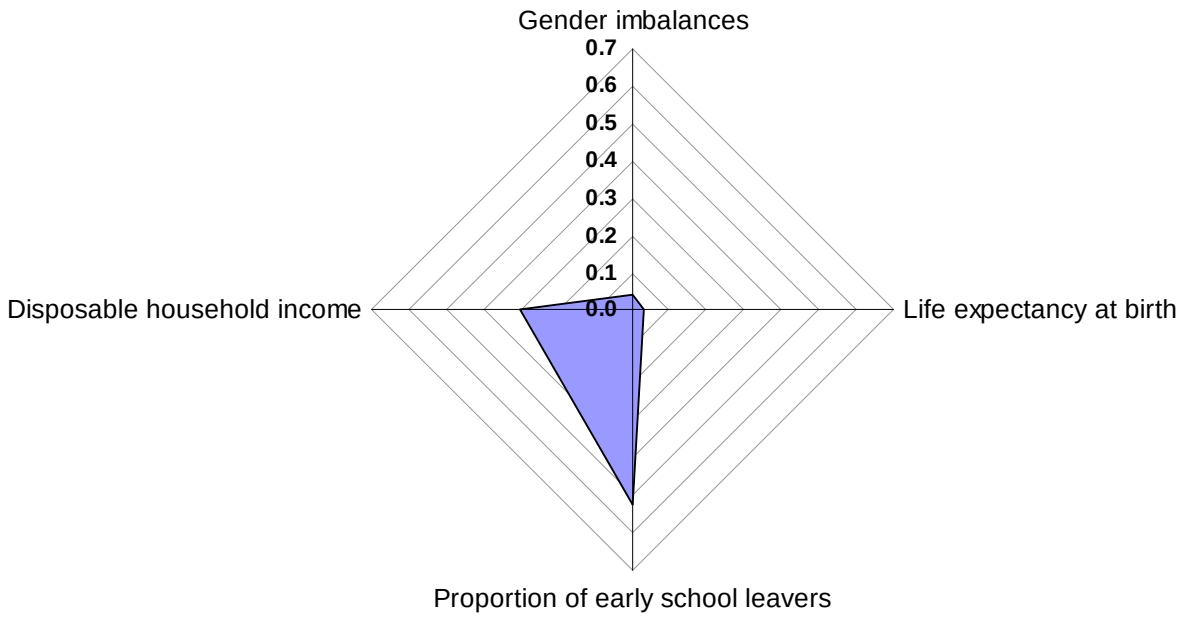


Figure 19. Disparities for territorial objective "Inclusion and quality of life" (standard deviation / average)

In the above figure, we can certainly note the imbalances of disparities. Life expectancy at birth - representing health - and gender imbalances - representing demographic structure of population - show low levels of disparities between European territories. Disposable household income presents more disparities but, as stressed by the diagram, the proportion of early school leavers disparities is particularly worrying and should be of priority for policy action, though it is part of national policy and not always depending of the local levels as measured by the indicators.

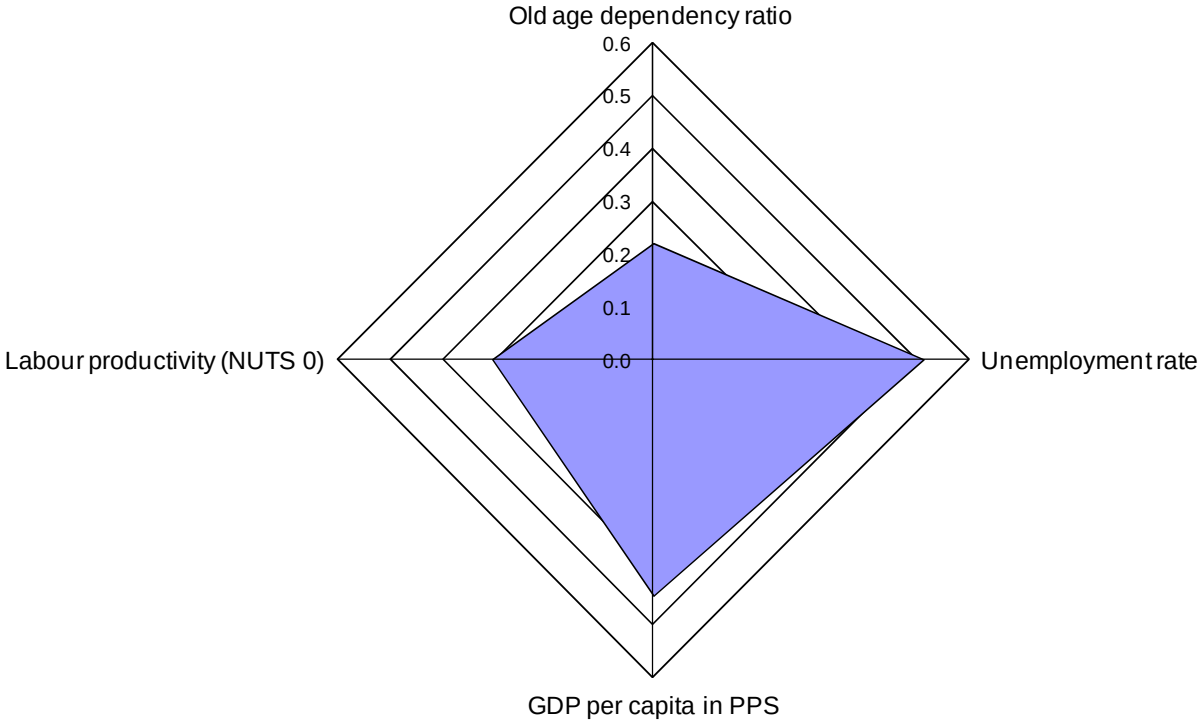


Figure 20. Disparities for territorial objective "Strong local economies ensuring global competitiveness" (standard deviation / average)

In the above diagram, we can note a strong disparity in terms of unemployment rate, consistent with the level of disparities in GDP/capita in PPS. On the other hand, labour productivity is getting better in terms of disparities, the result of the catching up of regions that previously leg behind. The old age dependency ratio shows no strong disparities, when the result is certainly hiding some local disparities not seen in the general trend.

Some examples of such synthetic diagrams are presented in chapter "C.3. Indicators presentation" but their production was clearly limited by the data availability.

C.3. Indicators presentation

The territorial cohesion indicators as selected and defined in INTERCO project are presented in the following chapters. Basically, following chapter "B.2.2. Reasoning scheme for the final set of indicators" (p. 17), the indicators are presented by territorial objective. First, the territorial objectives and the rationale behind the indicator selection is described. Then, each indicator is presented in a standardised manner, in the form of a fact sheet. Each fact sheet starts with basic information on the indicator, along with an indicator description, followed by a diagram illustrating the minima, mean and maxima values per country for the latest available year. Graphs of convergence are also shown (if available) :

- sigma convergence : evolution of disparities
- beta convergence : trends in relation to states, i.e. revealing possible catching-up process (lagging behind territories should progress better than other ones)

These graphs are followed by the indicator map, which also includes the sigma convergence graphs (if available).

Indicator presentation for each territorial objective concludes with a short summary highlighting the main findings and focusing on the indicator developments (trends towards cohesion or towards increasing disparities).

C.3.1. Strong local economies ensuring global competitiveness

A more balanced and sustainable competitiveness is needed within Europe and for its role in a globalised economy. This was already the objective of ESDP and continues to be of great importance in TA 2020 and Europe 2020. Regions should aim at a sustainable growth through a more competitive economy based on higher productivity. Strong local economies and communities are key players for that. Thus, one should look at local challenges to underline local disparities, especially on what can shadow long-term growth: demographic challenge (ageing) and quality of labour market.

Four indicators are proposed as territorial cohesion indicators under this objective:

- GDP per capita in PPS
- Overall unemployment rate
- Old age dependency ratio
- Labor productivity

These indicators are dedicated to measure the overall economic output of all activities (GDP per capita in PPS), the quality of the regional labour markets (unemployment rate), the labour market age structure (old age dependency ratio), and the competitiveness of a region compared to global market (labour productivity).

As for the indicator on labour productivity, European statistics provide time series data for a period of 1995-2010 only at national level. Therefore, the related indicator called labour productivity in industry and services was also tested, which is available at least at NUTS 2 level, but only for one point in time and not as time series. So the reader will find two productivity maps here.

Consequently, in the indicator wishlist it is recommended to collect data on labour productivity per persons employed at regional level (NUTS 3).

As all four indicators are available for several years, sigma and beta convergence plots have been generated helping to analyse the temporal dimension of cohesion, i.e. to analyse trends towards cohesion (for labour productivity only at national level). For indicators at NUTS 3 level (GDP per capita in PPS, unemployment rate, old age dependency ratio), this analysis was furthermore conducted by differentiating five types of regions (predominantly urban regions, intermediate regions close to a city, intermediate regions remote, rural regions close to a city, rural regions remote) which may provide additional insights into the spatial development of cohesion trends in Europe.

GDP per capita in PPS

Theme:

0708 ECONOMY, LABOUR FORCE. Business, all sectors

Policy relevance:

This indicator measures the overall economic output of all economic activities. It provides insight into economic strength and regional growth.

Desired direction of change:

Increase of GDP per capita is desired generally for all regions; however, lagging regions and regions in rural or peripheral areas should catch up faster.

Description:

The map highlights two main spatial divides: first, there is a strong concentration of GDP per capita in capital city regions and in big agglomerations. Second, the map illustrates the still existing clear East-West divide between the old and the new EU Member States, with Eastern Europe experiences significant lower GDP levels compared to Western Europe.

The temporal development of disparities between European regions was quite distinct, as the sigma convergence graph shows: until 2001 disparities slightly increased for all types of regions; since then disparities decreased with highest decreases for intermediate, remote regions as well as predominantly rural regions (Figure 22); differences between predominantly urban regions, however, remained stable over time. Across all NUTS 3 regions, a slight trend towards cohesion could be observed for entire Europe.

This is generally confirmed by the beta convergence graphs (Figure 23), illustrating that for all region types those regions with lower levels of GDP per capita developed faster compared to those regions with higher GDP levels; however, because there are for all region types (except for remotely predominantly rural regions) regions with negative GDP developments, watering down the positive results, the overall sigma convergence trend is not as clear as it seems at a first glance.

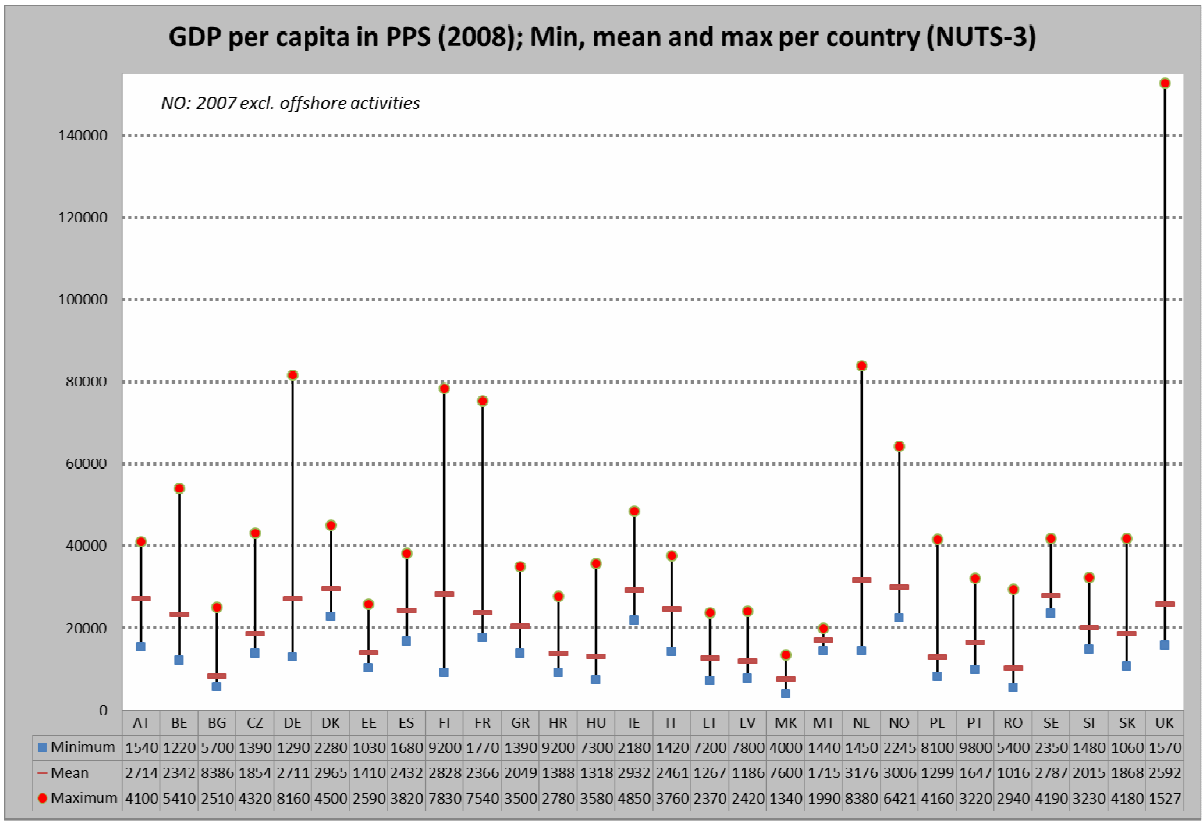


Figure 21. GDP per capita in PPS by country – Minima, maxima and averages

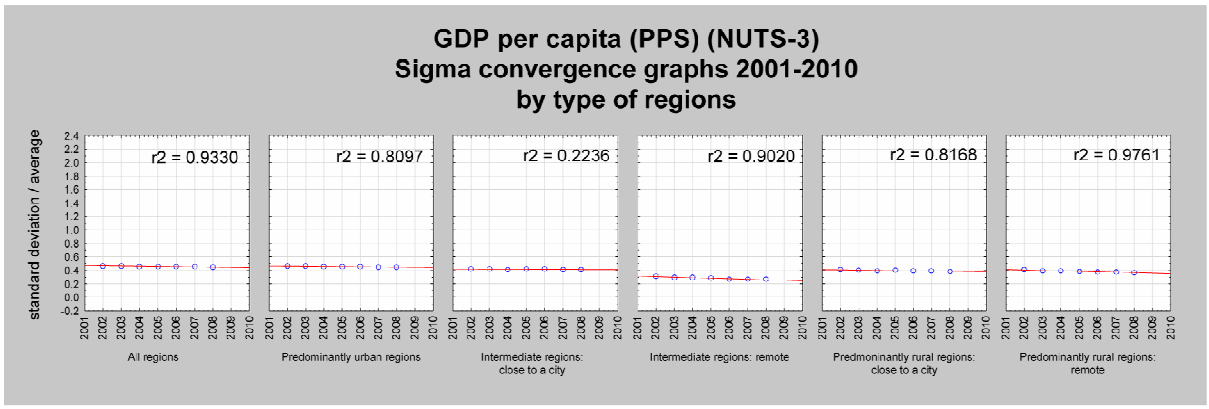


Figure 22. GDP per capita in PPS by type of region – development of disparities 2001-2010

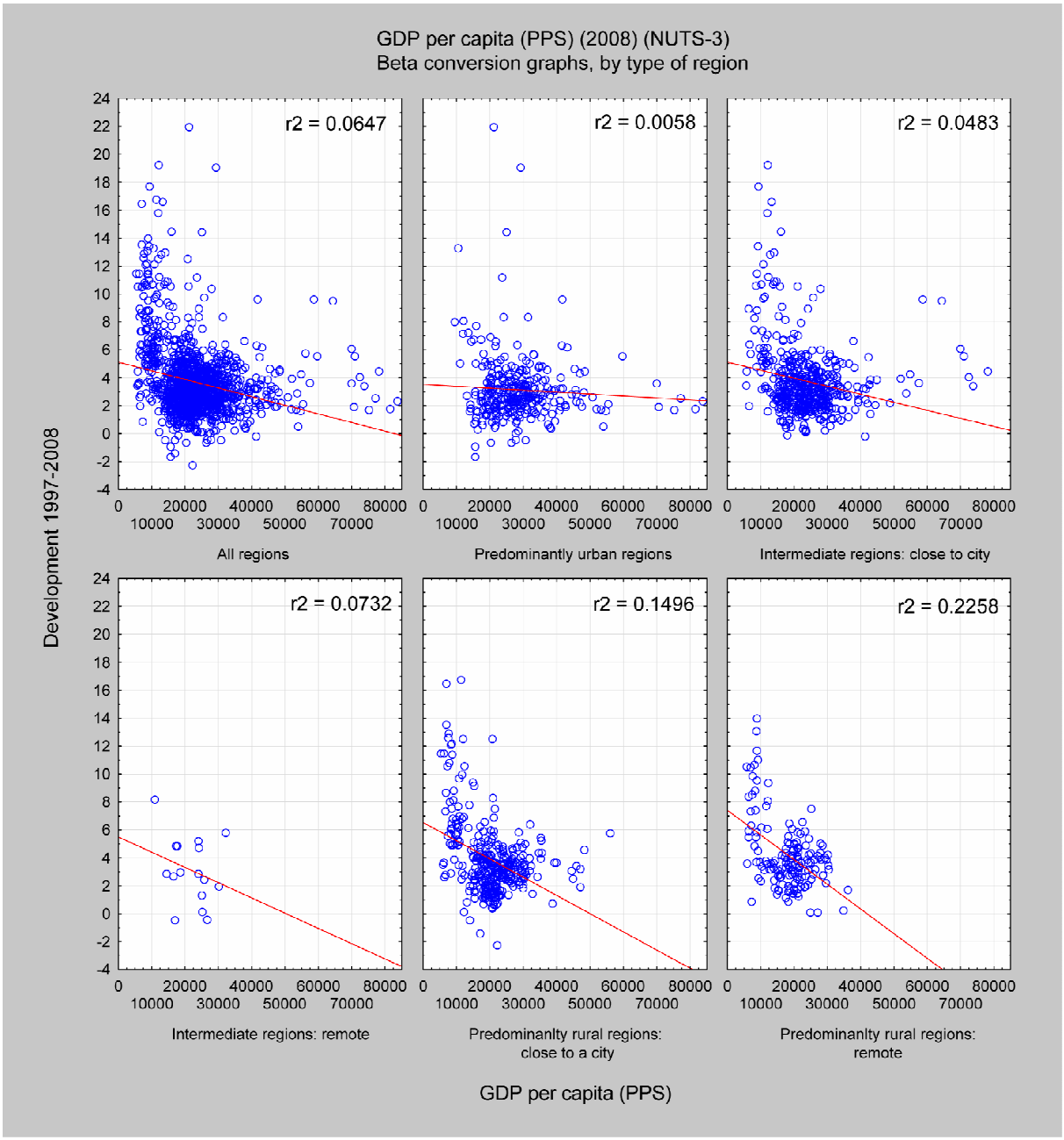


Figure 23. GDP per capita in PPS by type of region – beta convergence

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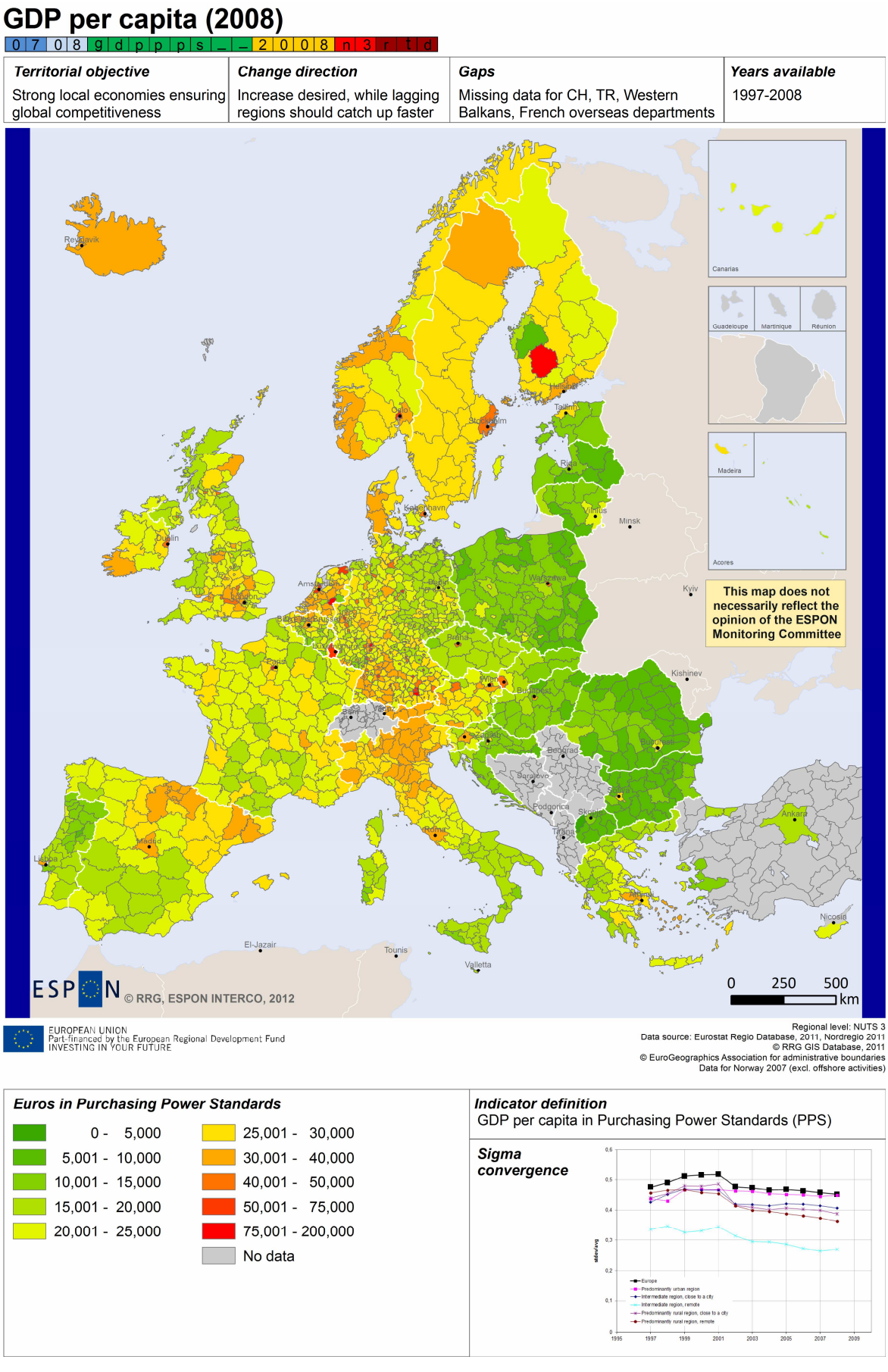


Figure 24. Indicator – GDP per capita 2008 (PPS).

Unemployment rate

Theme:

0702 ECONOMY, LABOUR FORCE. Employment, Unemployment

Policy relevance:

This indicator measures the quality and performance of regional labour markets. It constitutes a contextual indicator important to assess regional flexibility as well as sustainability of local economic activities.

Desired direction of change:

Generally a decrease of unemployment rates over total population is desired; particular attention needs to be paid to decrease unemployment in old industrialised areas and in rural areas or areas with specific geographical handicaps (such as islands, mountain regions or border regions).

Description:

Unemployment rates in Europe range from one percent (Norway, Alpine regions, Benelux, parts of Germany and the UK) up to almost 30 percent in Southern Spain. Some countries show only little variations (France, Portugal, Finland, and Sweden), other countries such as Germany, Spain, and Turkey or Romania reveal great differences among their regions (Figure 25). Development of unemployment rates differed to large extent across Europe. While regions in Poland, Finland and Southern Italy experienced a fall in unemployment, Sweden, Iceland, Ireland, England, parts of Spain, Italy and Hungary experienced significant increases in unemployment rates, partly as high as 20 percentage points. During 2006-2009, unemployment rates again increased in many countries due to the economic crisis. This increase, however, had quite different impacts on the development of disparities among different types of regions (Figure 26).

While disparities among predominantly urban regions remained unchanged, disparities increased among remote intermediate regions and also among remote rural regions; in contrast, disparities slightly decreased for intermediate regions that are close to a city, and significantly decreased for rural regions close to a city. Altogether, at European level this lead to a slight decrease in unemployment across all regions.

When analyzing the development of regional unemployment rates over a longer period since 1999, the beta convergence confirms (Figure 27) these heterogeneous developments: even though generally in regions with higher unemployment rates unemployment even increased, the situation in regions with lower unemployment rates is not that clear: there are regions with increasing but also with decreasing unemployment. This observation holds true for all types of regions.

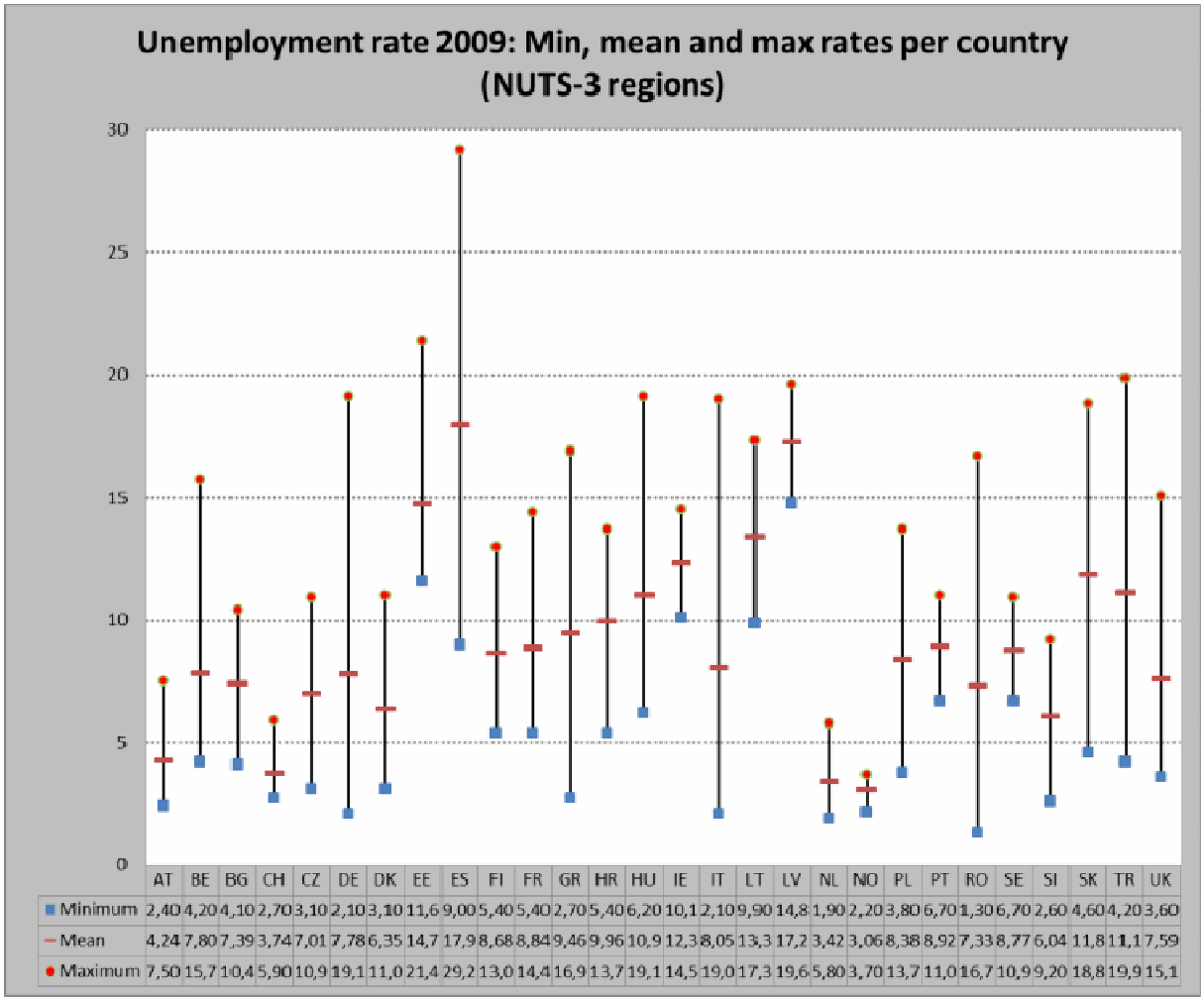


Figure 25. Unemployment rates by country – Minima, maxima and averages

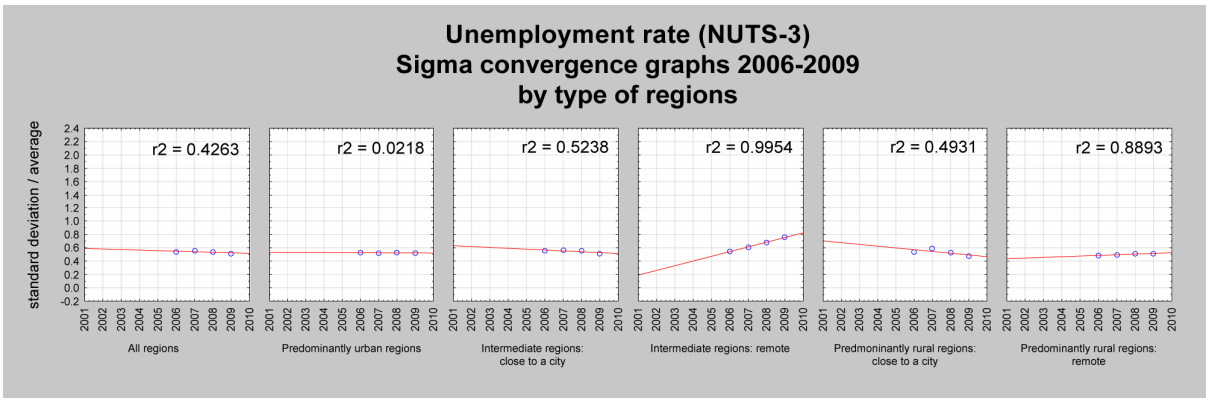


Figure 26. Unemployment rate by type of regions - development of disparities 2006-2009

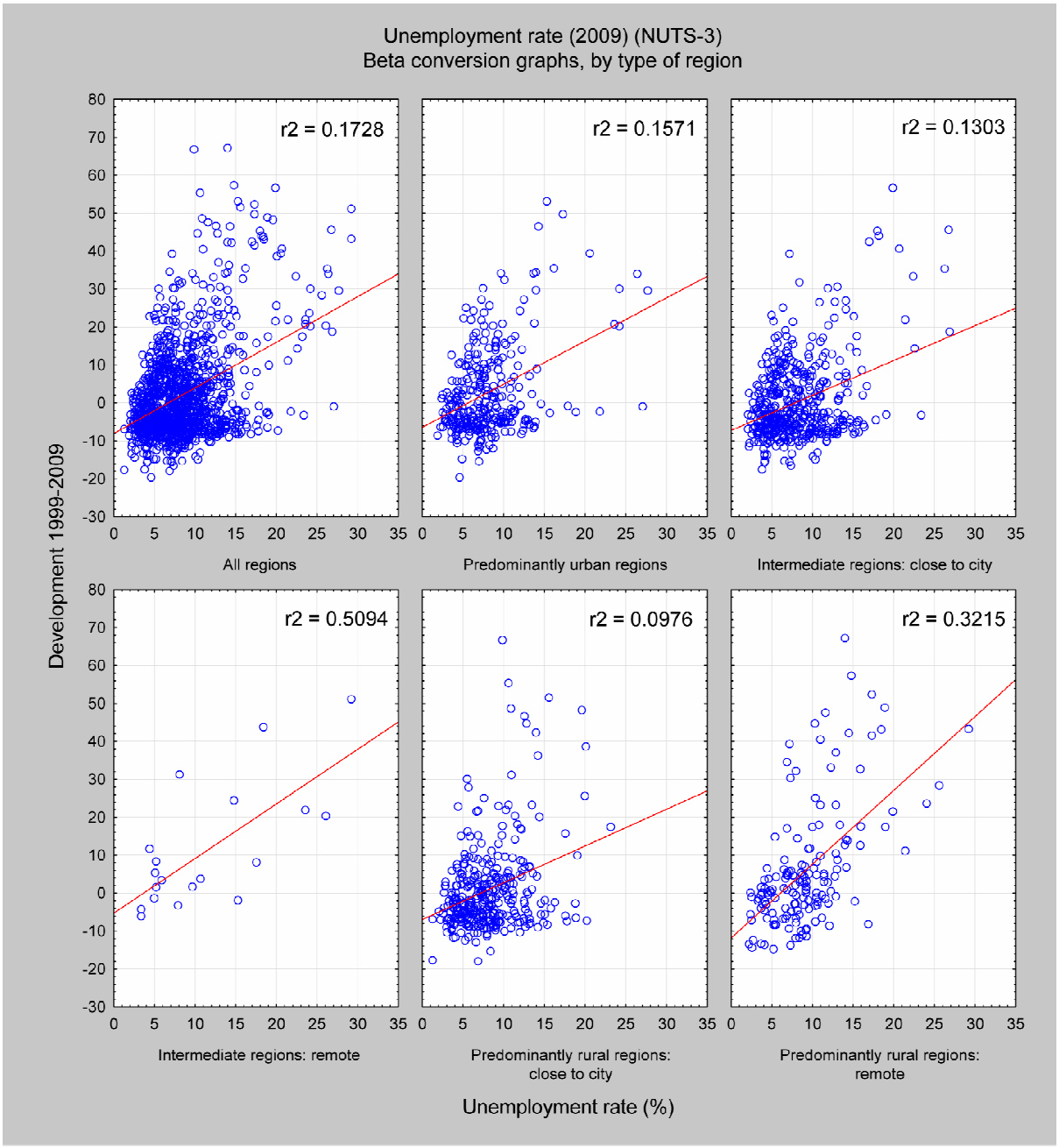
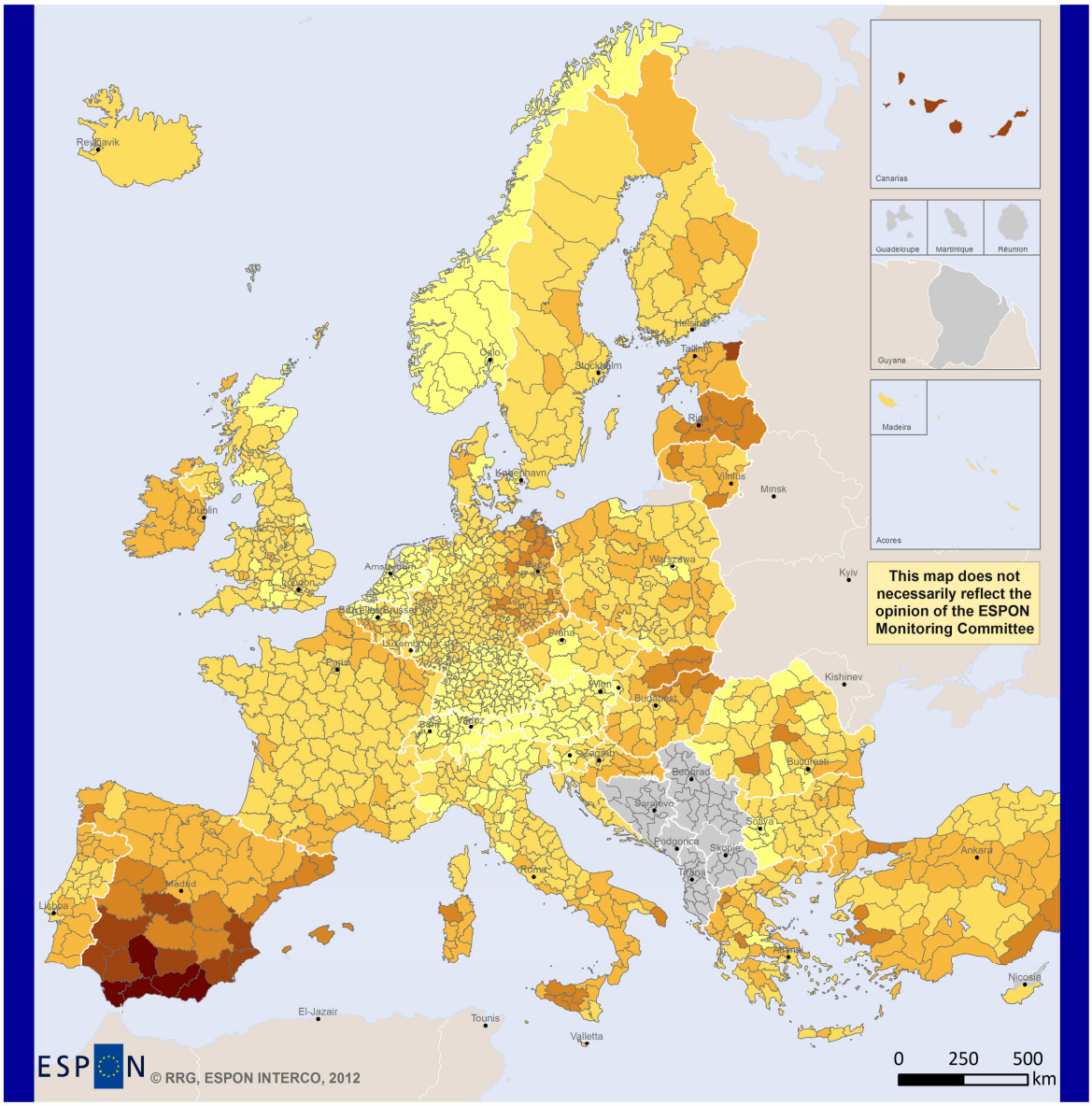


Figure 27. Unemployment rate – beta convergence

Unemployment rate (2009)

0 7 0 2 u n e m a l l _ 2 0 0 9 n 3 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Strong local economies ensuring global competitiveness	Decrease desired: old industrialized regions/ rural areas	Missing data: LI,WB,FOD. Data for BE, BG, CH, HR, IS, PT, NO, TR at NUTS-2	1999-2009



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Regional level: NUTS 2, NUTS 3
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in %

1 - 5	16 - 20	No data
6 - 10	21 - 25	
11 - 15	26 - 29	

Indicator definition

Number of unemployed people divided by total labour force.

Sigma and beta conv.

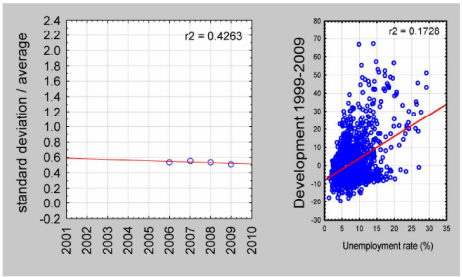


Figure 28. Indicator – Unemployment rate (%).

Old age dependency ratio

Theme:

0201 DEMOGRAPHY. Population structure

Policy relevance:

This indicator measures the percentage of working class population in relation to elderly, retired people. It warns about overaging of population that may lead to severe problems in pension systems and also to social disruptions, affecting sustainability of local economies.

Desired direction of change:

Generally a society should strive for a balanced population structure in terms of percentage of different cohorts. Thus, development over time should ensure a balanced age structure and should try avoiding overaging.

Description:

Generally the indicator illustrates that the size of the working-class population in East European countries is higher compared to West European or Scandinavian countries, as more people in working-age exist compared to elderly people. But even in Western Europe there are distinct areas with extremely high dependency ratios, such as in Southern France, Eastern Germany, the border area between Spain and Portugal or Greece, leading to high variations in indicator performance at NUTS 3 level within the countries (Figure 29). Even though variations for all countries are quite high with often 10-15 percentage points difference between the worst and best performing regions, Spain, Germany, Portugal, Greece and France are remarkable since they yield extremely high variations up to 30 percentage points (Figure 29).

Even though in remote rural regions disparities decreased between 2007 and 2009 or remained stable for rural regions close to a city (Figure 30), slightly increasing disparities for intermediate regions and for predominantly urban regions led to a small increase in disparities over all NUTS 3 regions in Europe until 2009.

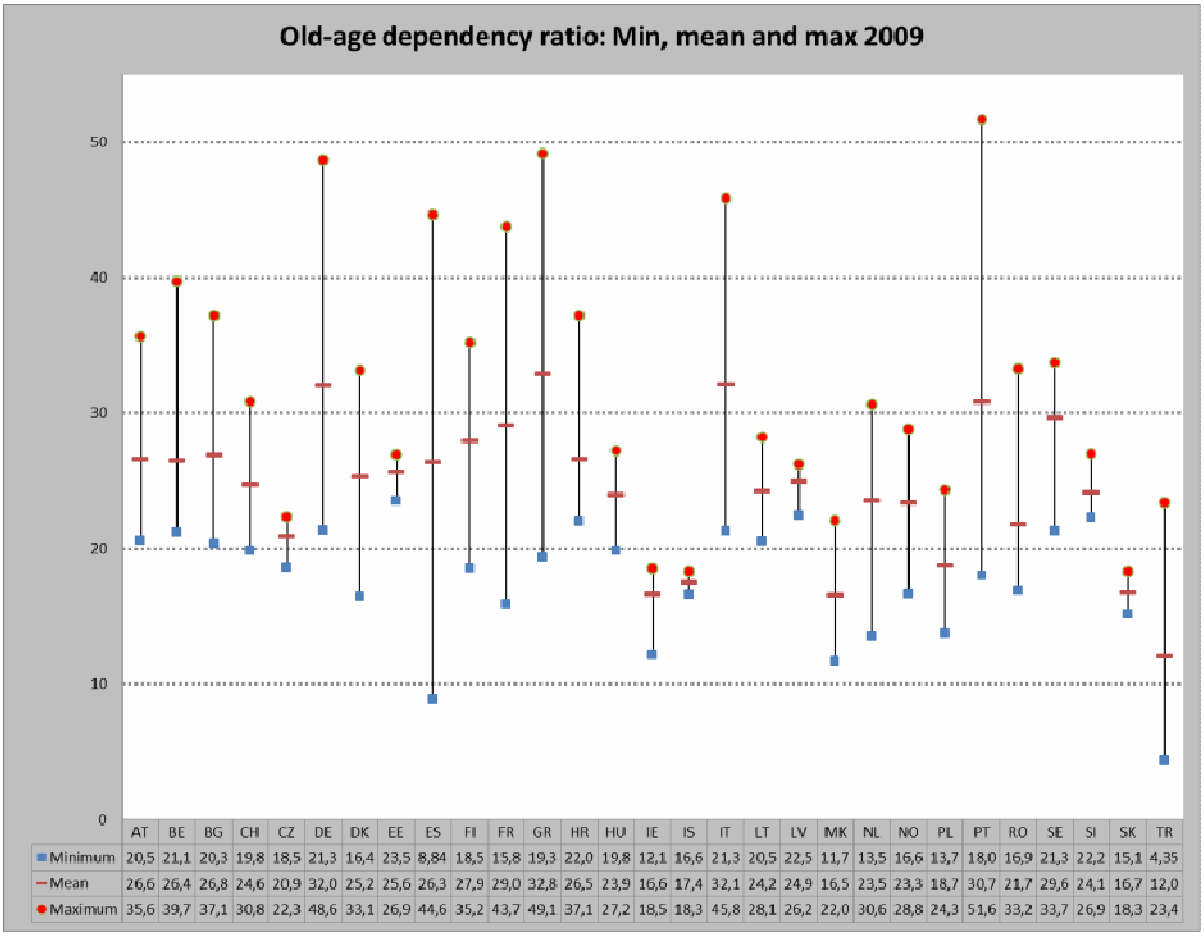


Figure 29. Old-age dependency ratio by country – minima, maxima and averages

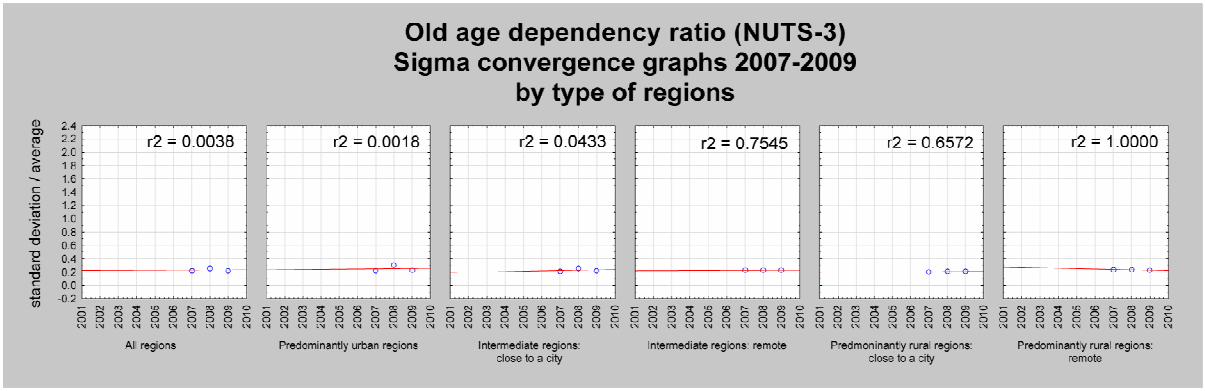


Figure 30. Old age dependency ratio – development of disparities 2007-2009

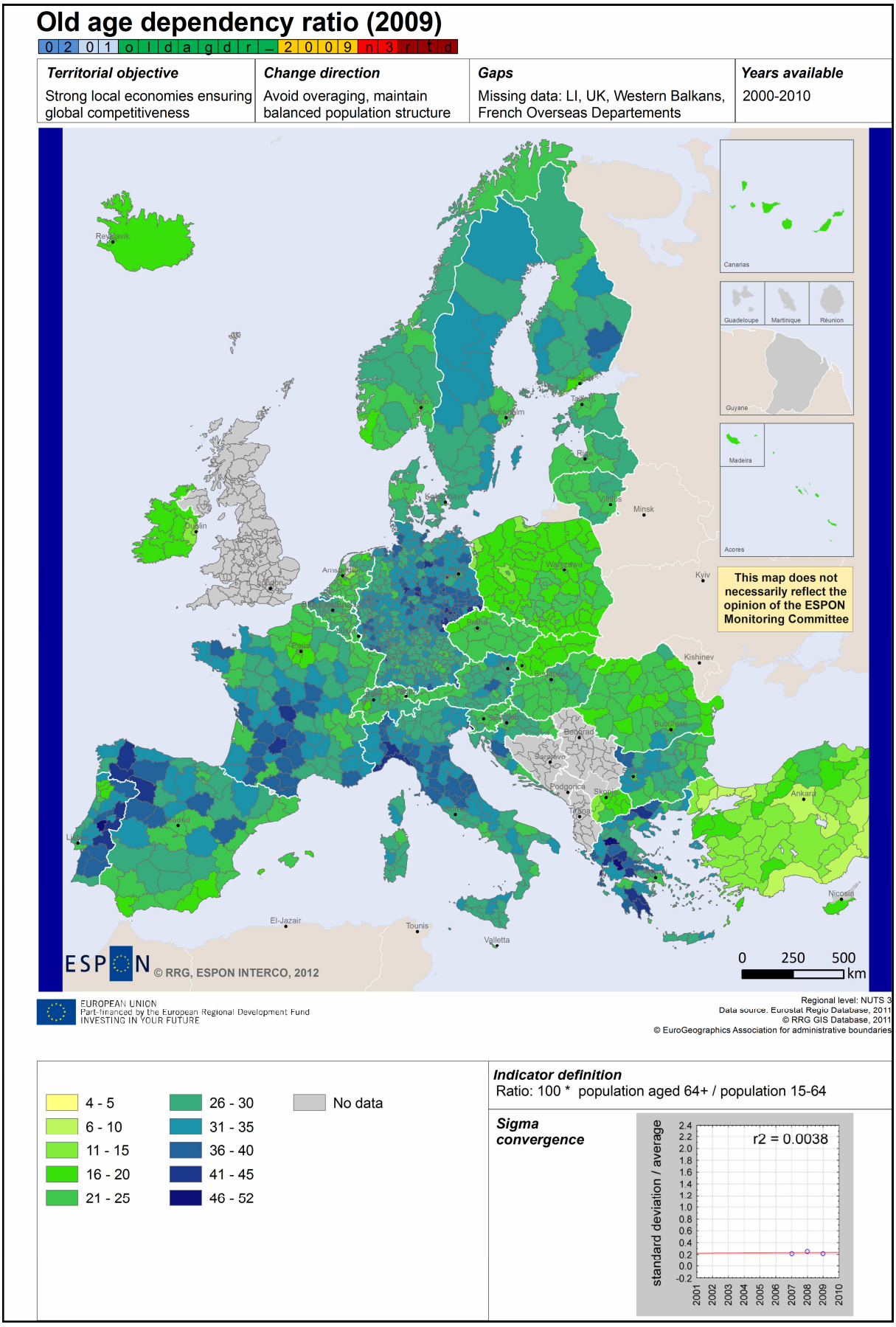
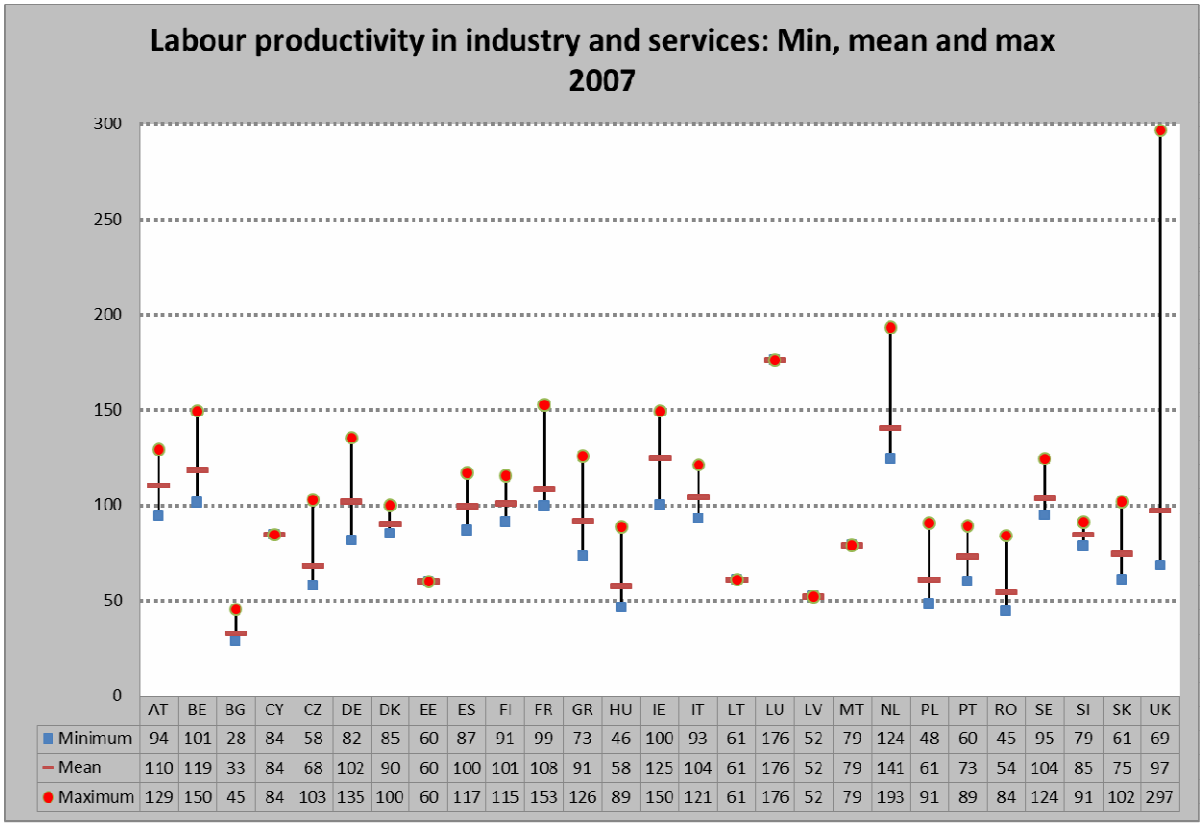


Figure 31. Indicator – Old age dependency ratio.

Labour productivity

Theme: 0701 ECONOMY, LABOUR FORCE. Labour force
Policy relevance: This indicator tells us the robustness of GDP produced and shows the competitiveness of a region in global economies.
Desired direction of change: Generally increase is desired to prepare European regions for difficult global markets; however, regions with less than 50% of EU27 average should catch up faster.
Description: There is a clear divide between the old EU Member States and the new EU Member States, with all of the latter ones experiencing productivity levels below the EU average (with Bulgaria and Romania experiencing the least productivities). From the old EU Member States only Greece and Portugal have levels slightly below EU average. At the contrary, Luxembourg, Belgium, Ireland and Norway gain the highest labour productivities with up to 178 of the EU27 average. When looking at the productivity in industry and service sector, the picture is even more distinct. In addition to the above patterns, there is also a clear North-South divide in several countries (Spain, Italy, Germany), and also a urban-rural divide (UK, Greece, France, Germany) with urban areas experiencing higher productivities compared to their surrounding regions, leading to large intra-national disparities (see also min, mean, max graph in Figure 32). At national level, disparities in labour productivity decreased in the period of 1998-2009 (Figure 33) remarkably as an effect both of improvements in productivity of least-performing regions and slight decreases of productivity of better performing regions (Figure 34).



	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LU	LV	MT	NL	PL	PT	RO	SE	SI	SK	UK
Minimum	94	101	28	84	58	82	85	60	87	91	99	73	46	100	93	61	176	52	79	124	48	60	45	95	79	61	69
Mean	110	119	33	84	68	102	90	60	100	101	108	91	58	125	104	61	176	52	79	141	61	73	54	104	85	75	97
Maximum	129	150	45	84	103	135	100	60	117	115	153	126	89	150	121	61	176	52	79	193	91	89	84	124	91	102	297

Figure 32. Labour productivity in industry and services by country – minima, maxima and averages

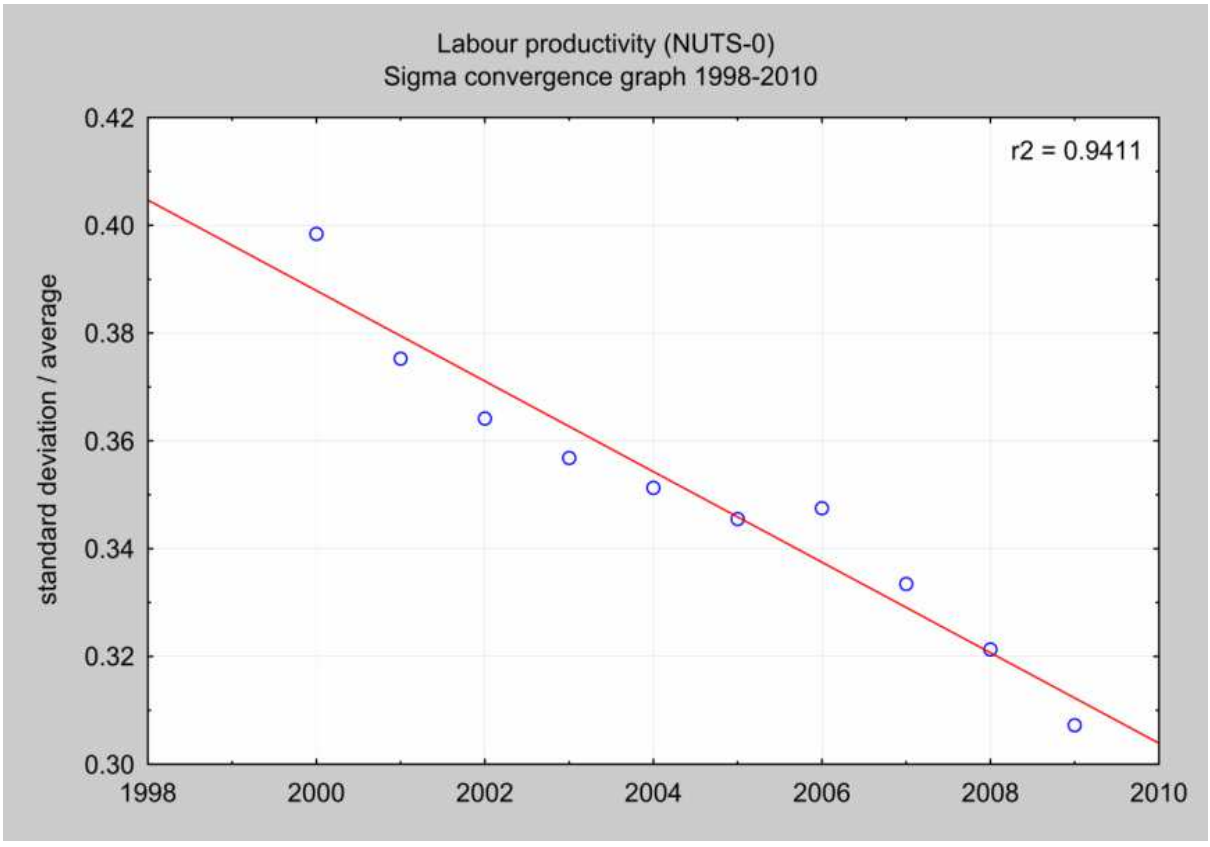


Figure 33. Labour productivity (NUTS 0) – development of disparities 1998-2010

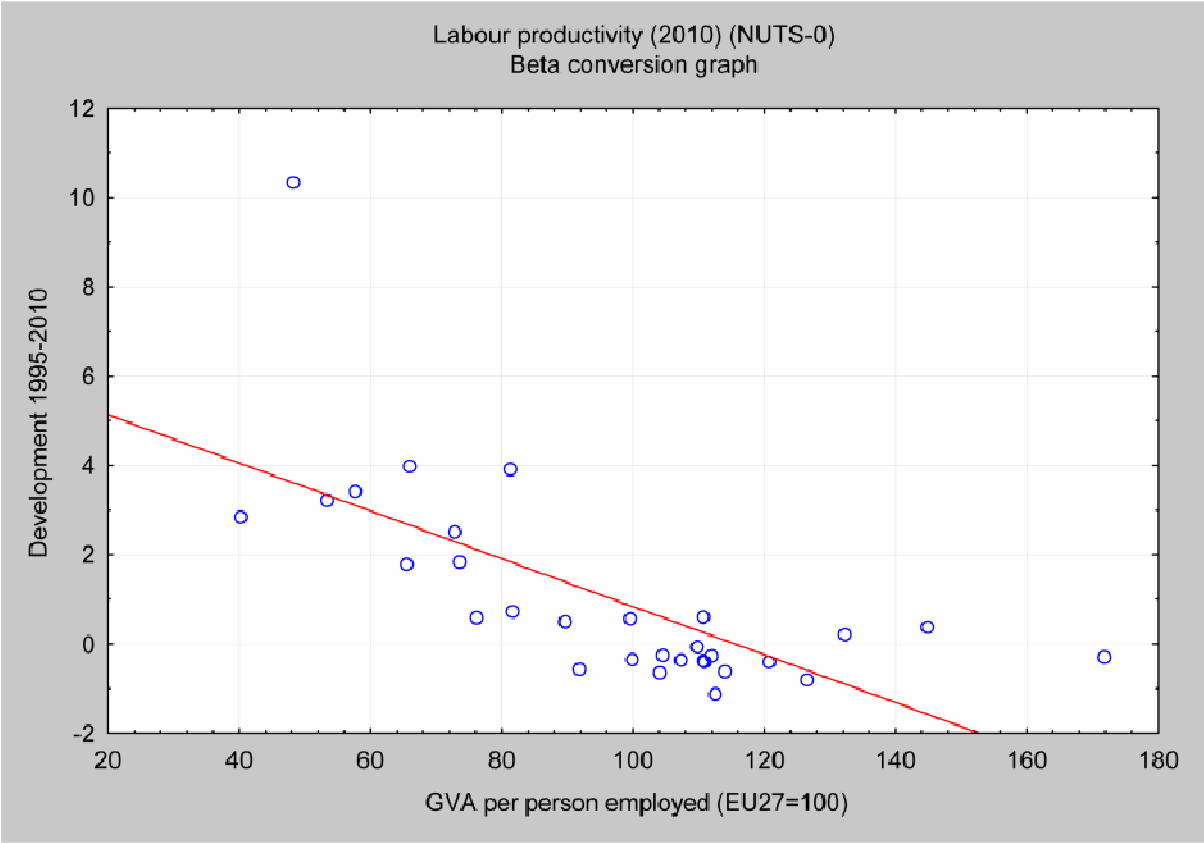
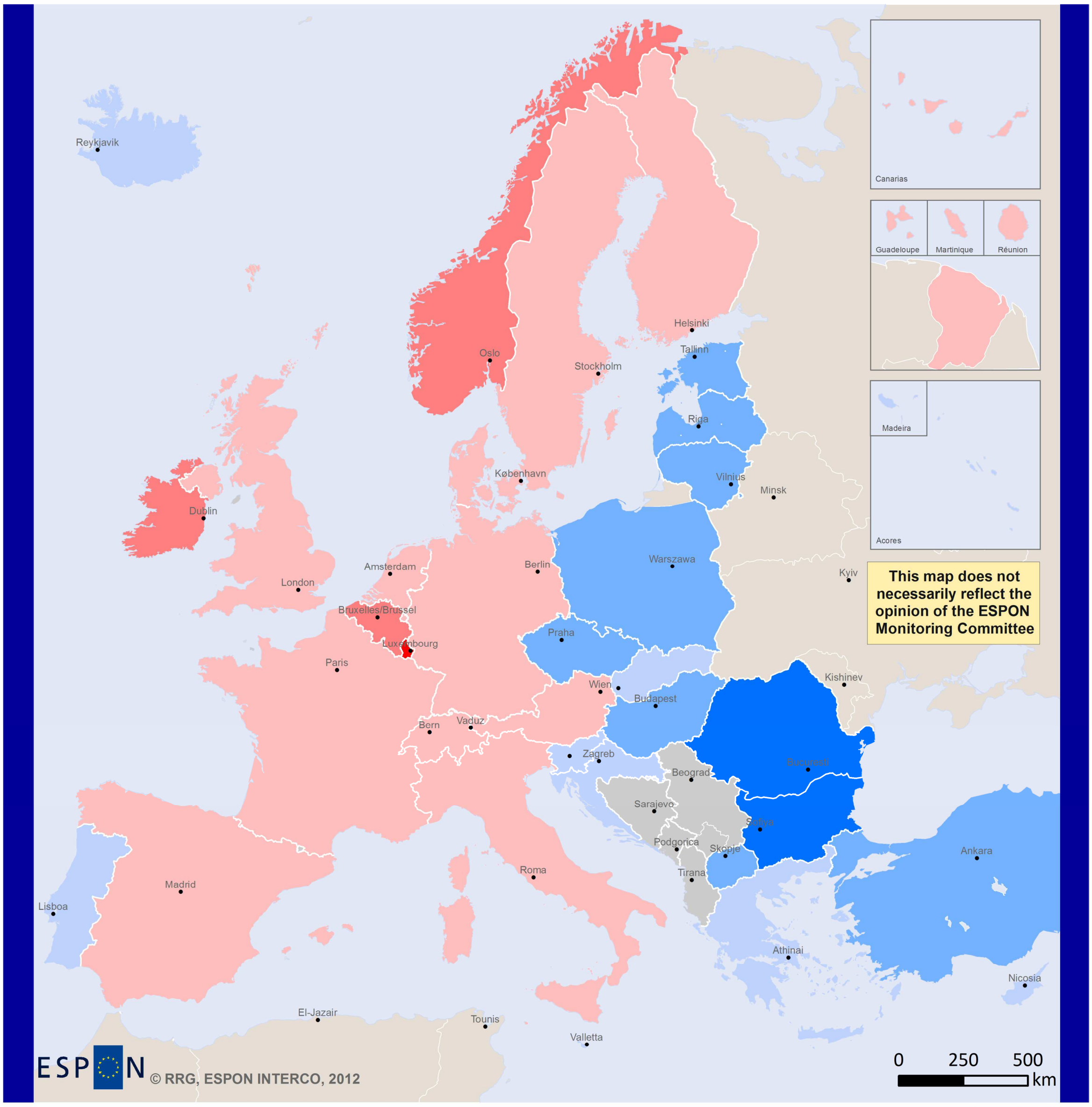


Figure 34. Labour productivity (NUTS 0) – beta convergence

Labour productivity per person employed (2010)

07 01 labprpe_2010 n0rtp

Territorial objective	*Change direction*	*Gaps*	*Years available*
Strong local economies ensuring global competitiveness	Increase desired, while lagging regions should catch up faster	Missing data for LI and Western Balkans	1995-2010



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EU27=100

below EU average
- 42 - 50
- 51 - 75
- 76 - 100

above EU average
- 101 - 125
- 126 - 150
- 151 - 178

No data

Indicator definition
GDP in PPS per person employed relative to EU27 average

Sigma convergence

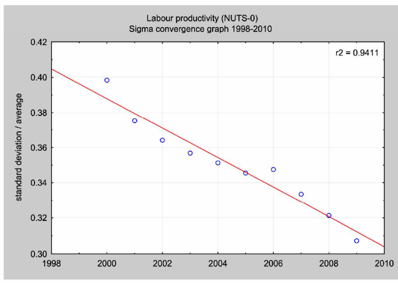
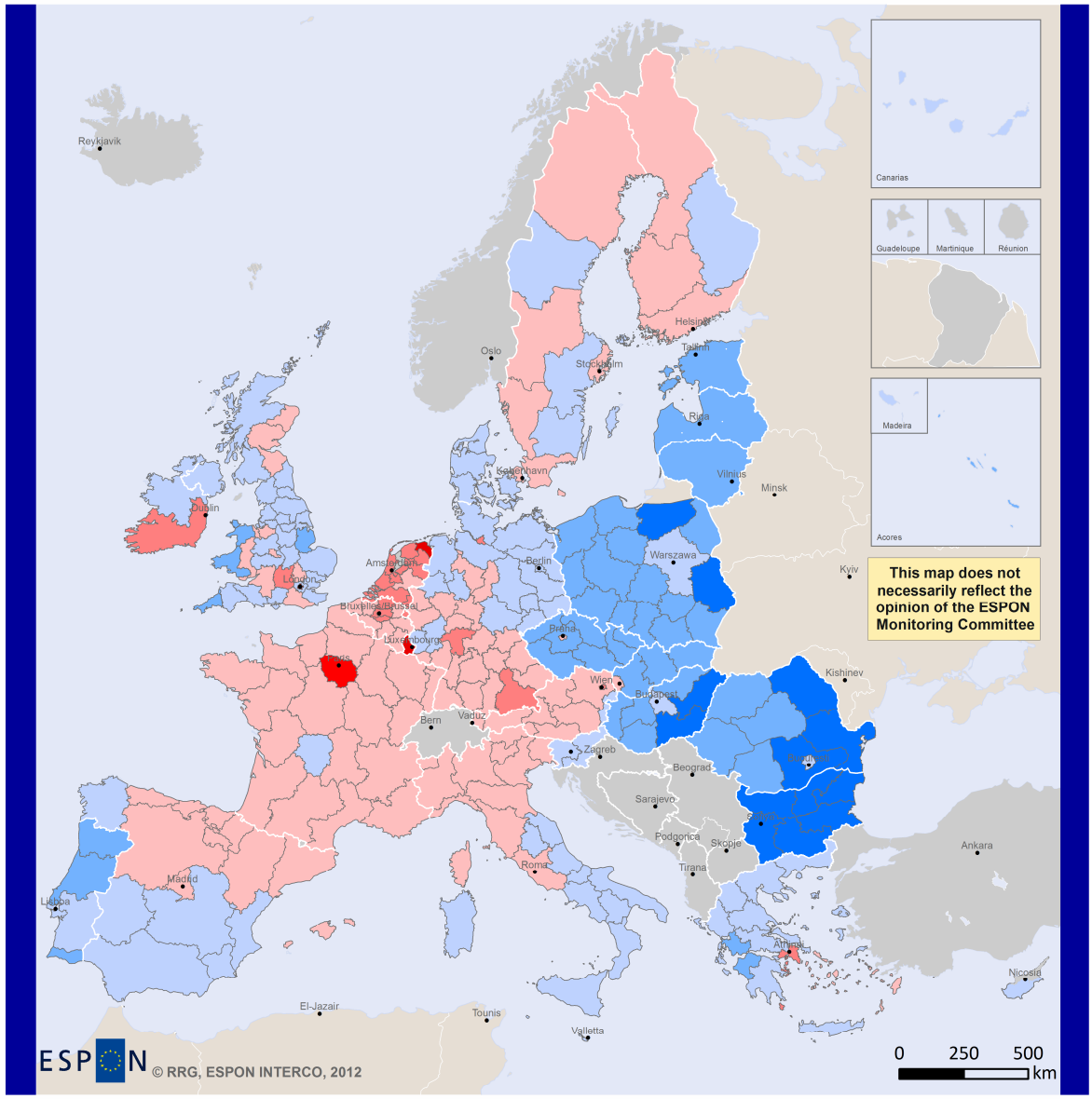


Figure 35. Indicator – Labour productivity per person employed (NUTS 0).

Labour productivity in industry and services (2007)

0 7 0 1 l a b p r i s _ 2 0 0 7 n 2 r t p

Territorial objective	*Change direction*	*Gaps*	*Years available*
Strong loca economies ensuring global competitiveness	Increase desired, while lagging regions should catch up faster	Missing data for CH, IS, LI, NO, TR, Western Balkans, French overseas d.	2007



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Regional level: NUTS 2
Data source: Eurostat, 5th Cohesion Report, 2011
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EU27=100

below EU average	*above EU average*	
28 - 50	101 - 125	No data
51 - 75	126 - 150	
76 - 100	151 - 175	
	176 - 200	
	201 - 297	

Indicator definition
GVA per person employed in industry and services

Sigma convergence

Figure 36. Indicator – Labour productivity in industry and services (NUTS 2)

Summary

What are the territorial disparities of the indicators selected for the territorial objective of strong local economies ensuring global competitiveness? And how have these indicators developed over the last decade?

The indicator ***GDP per capita in PPS*** revealed quite distinct developments of disparities, with slight increase until 2001 for all type of regions, and slight trend of convergence afterwards (however, with some differences for different types of regions). As desired, results show that trend of convergence in remote regions (intermediate and rural) was highest, while disparities in urban regions or regions close to a city remained stable.

For all European regions, a slight trend towards convergence of ***unemployment rates*** could be observed over the recent past (2006-2009). Even though this overall trend of convergence is appreciated, there is no harmonious trend of convergence for all rural regions, as desired, since only those rural regions close to a city reduced disparities in unemployment, while the same disparities for remote rural areas increased in the same period. For urban regions, including the old industrialised ones, disparities remained.

Despite slight convergence trends in the ***old age dependency ratio*** for rural regions, slight increases in disparities for intermediate and urban regions led to an overall increase in disparities. Thus, the desired direction of change is not met, neither in terms of cohesion trends as a whole nor in terms of striving for a balanced age structure.

For ***labour productivity***, remarkable trends toward cohesion at national level could be observed with least performing regions catching up faster than good performing ones. Thus, the indicator moved into the desired direction of change.

Over all four indicators, there is no general trend towards convergence. While GDP per capita and unemployment rates only reveal slight positive effects, opposite negative development can be observed for the old age dependency ratio (Figure 37). Only labour productivity showed clear trends towards cohesion, albeit measured at national level.

Notwithstanding the recent development trends, big disparities among NUTS regions in Europe for GDP per capita and unemployment rates still remained, as Figure 38 illustrates, while disparities for the old age dependency ration is lowest, followed by labour productivity (at NUTS 0).

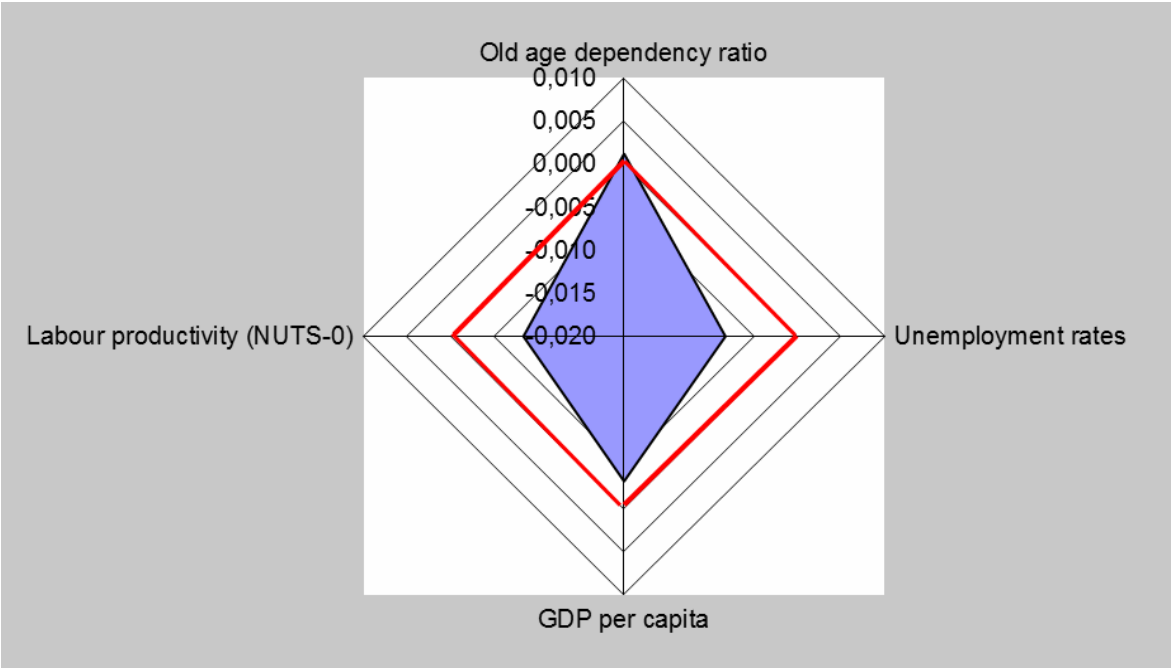


Figure 37. Degree of convergence (slope) for indicators under Territorial Objective "Strong local economies ensuring global competitiveness"

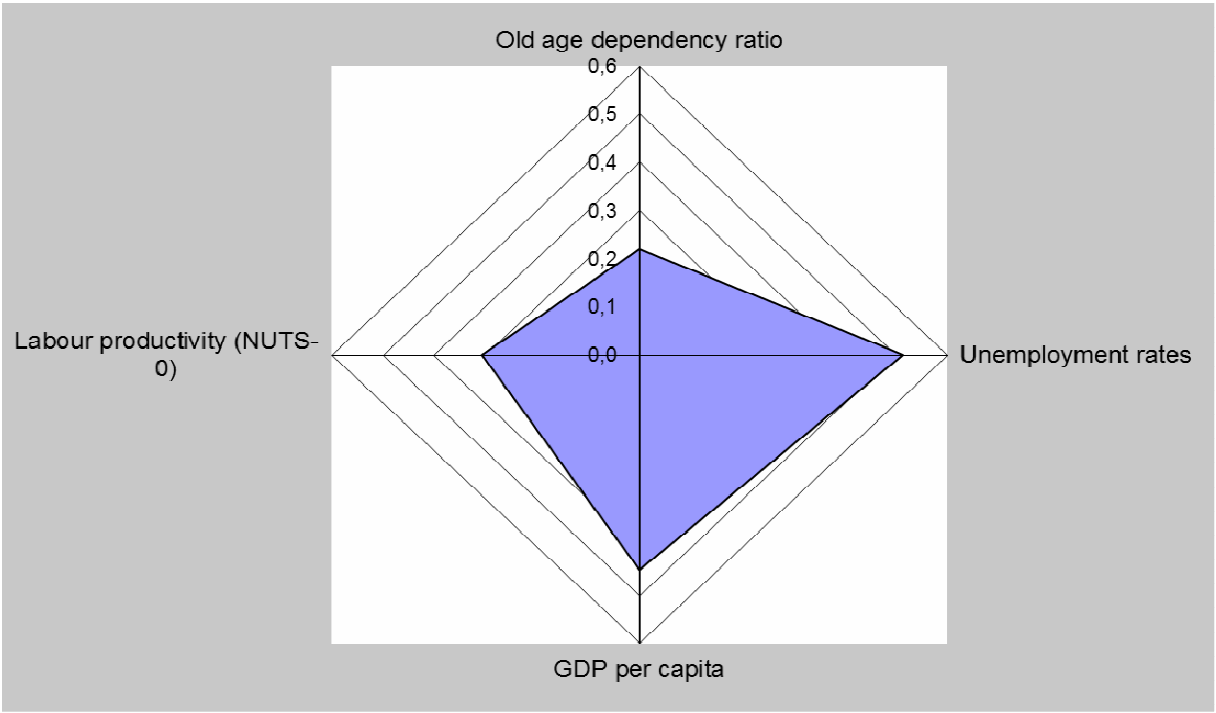


Figure 38. Degree of actual disparities for indicators under Territorial Objective "Strong local economies ensuring global competitiveness"

C.3.2. Innovative territories

Innovation is at the centre of EU strategies for recovery, growth and sustainable development. Because it can help creating and distributing wealth and facing current challenges, it is central for territories which can find their proper way to make good use of their assets. Especially, eco-innovation is expected to deliver appropriate response to the need of energy efficiency and low carbon economy, while innovation in the governance process will help rationalising and improving the institutional framework for better territorial governance. Thus, research and development should not be only for top class territories and actors. But the key determinant of innovation capacity and regional growth is certainly human capital, which means not only educated population but also its effective participation to growth.

Three indicators are proposed as territorial cohesion indicators under this objective:

- Population aged 25-64 with tertiary education (sometimes "tertiary education")
- Intramural R&D expenditures
- Employment rate 20-64

These indicators are dedicated to measure the qualification level of regional labour forces (tertiary education), the degree of participation of population in working age in actual economic activities (employment rate), and the future orientation of the regional economies in terms of investments in R&D.

Sufficient time series data are only available for the two indicators on tertiary education and employment rate, allowing generating sigma and beta convergence plots and thus allowing analyses of convergence trends over time. Since these two indicators are currently available only at NUTS 2 level, a further differentiated analysis by types of regions at NUTS 3 level could unfortunately not be performed.

Population aged 25-64 with tertiary education

Theme:

0602 SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE. Education

Policy relevance:

This indicator measures the highly-qualified labour force as basis for current and future R&D activities in a region. Human capital is an essential factor for innovation potential.

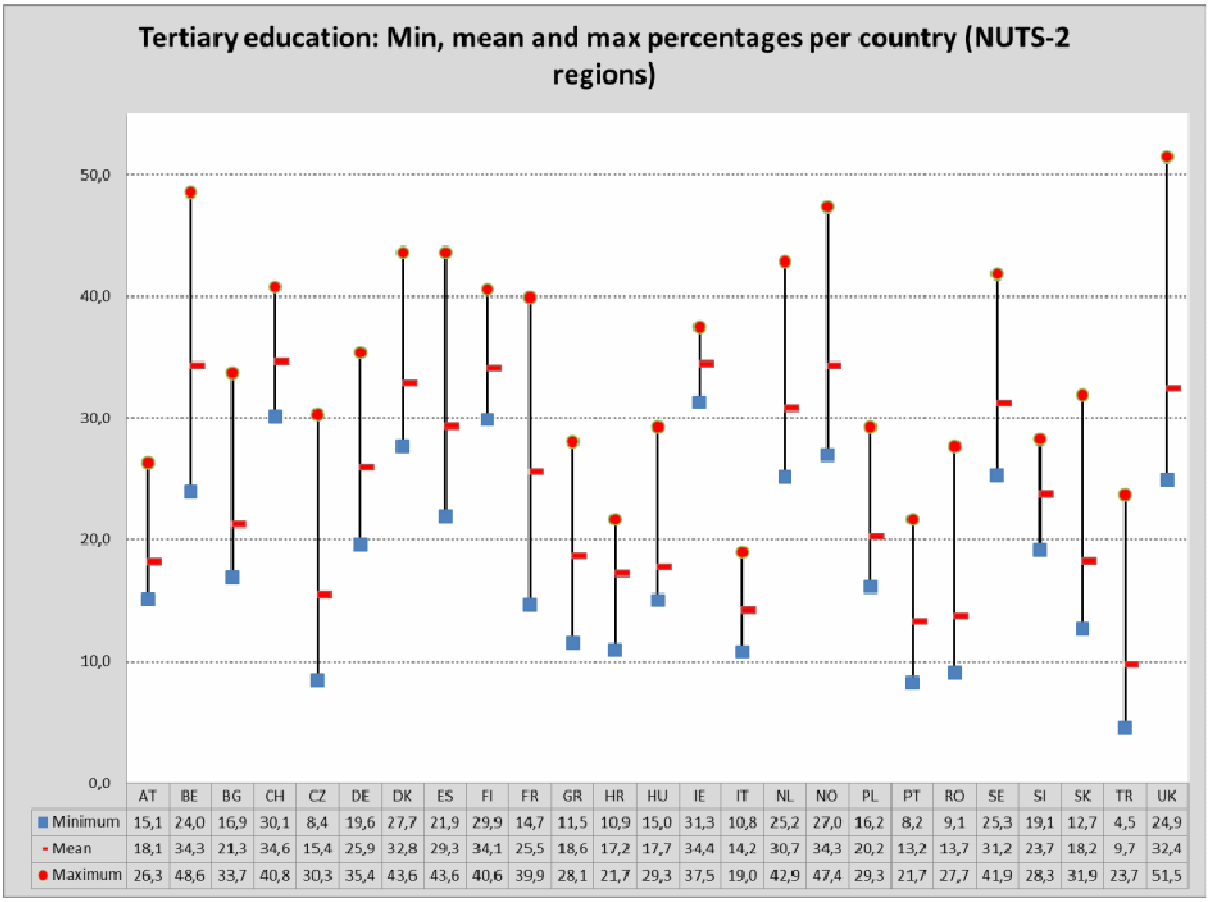
Desired direction of change:

Generally increase in skills and qualification levels of the entire labour force is desired; however, lagging regions, and regions in rural or peripheral areas should catch up faster than agglomerations.

Description:

The results are quite interesting. On the one hand they reveal great differences in the educational attainment at European level, ranging from mere 5 percent up to 52 percent at the top (capital cities, agglomerations). On the other hand the results also suggest that the intra-national differences are rather small, compared to the differences between the countries, so that one can assume that the differences are the outcome of the different national education systems (Figure 39).

The sigma convergence graph (Figure 40) illustrates convergence for the three analysed years (2008-2010), mainly driven by regions with relatively low levels of tertiary education who developed stronger compared to those regions who already had a rather high level of education (Figure 41).



	AT	BE	BG	CH	CZ	DE	DK	ES	FI	FR	GR	HR	HU	IE	IT	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
Minimum	15,1	24,0	16,9	30,1	8,4	19,6	27,7	21,9	29,9	14,7	11,5	10,9	15,0	31,3	10,8	25,2	27,0	16,2	8,2	9,1	25,3	19,1	12,7	4,5	24,9
Mean	18,1	34,3	21,3	34,6	15,4	25,9	32,8	29,3	34,1	25,5	18,6	17,2	17,7	34,4	14,2	30,7	34,3	20,2	13,2	13,7	31,2	23,7	18,2	9,7	32,4
Maximum	26,3	48,6	33,7	40,8	30,3	35,4	43,6	43,6	40,6	39,9	28,1	21,7	29,3	37,5	19,0	42,9	47,4	29,3	21,7	27,7	41,9	28,3	31,9	23,7	51,5

Figure 39. Tertiary education – minima, mean and maxima

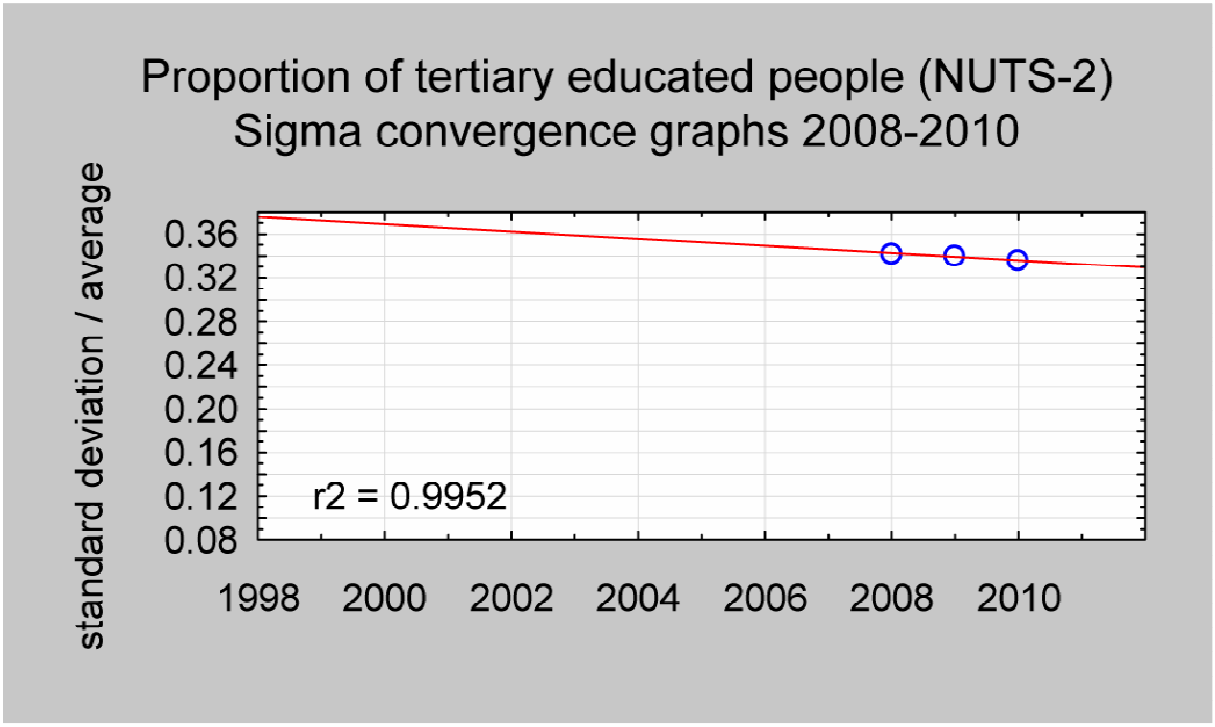


Figure 40. Tertiary education – development of disparities 2008-2010

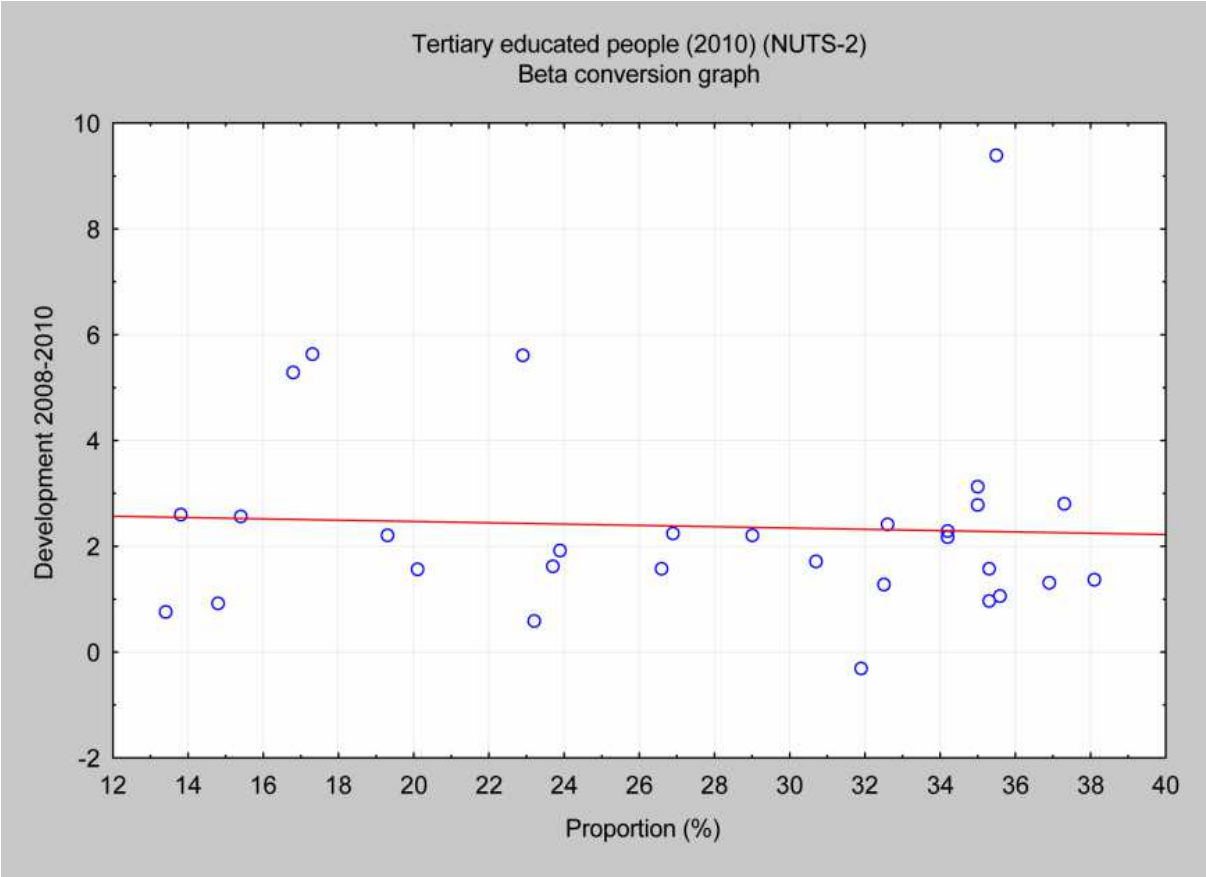
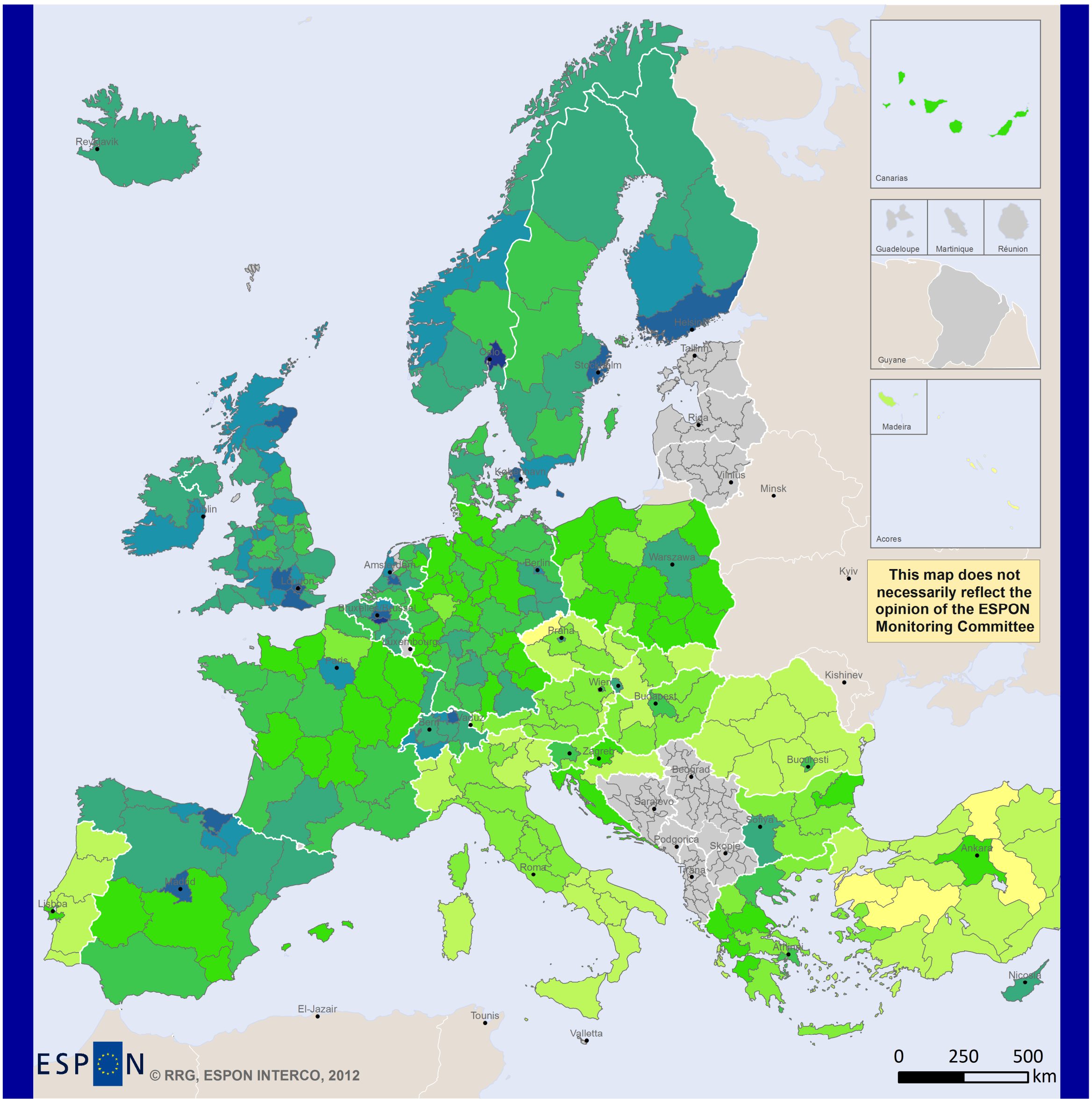


Figure 41. Tertiary education – beta convergence

Population aged 25-64 with tertiary education (2010)

0 6 0 2 t e r e d u – – 2 0 1 0 n 2 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Innovative territories	Increase desired; lagging/rural/ remote regions catch up faster	Missing data: IS, LI, LU, Baltic States Western Balkans, French overseas dep.	2008-2010



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Regional level: NUTS 2
Data source: Eurostat Regio Database, 2011; Statistics Iceland, 2011; Statistical Service Cyprus, 2011
© RRG GIS Database, 2011
© EuroGeographics Association for administrative boundaries

in %

6 - 10	31 - 35	No data
11 - 15	36 - 40	
16 - 20	41 - 45	
21 - 25	46 - 50	
26 - 30	51 - 53	

Indicator definition

Pop with teritary education as percentage of all pop 25-64

Sigma convergence

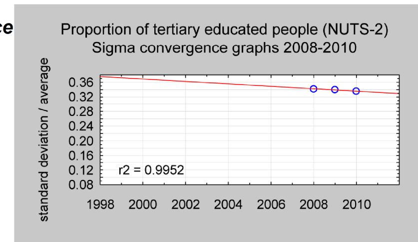
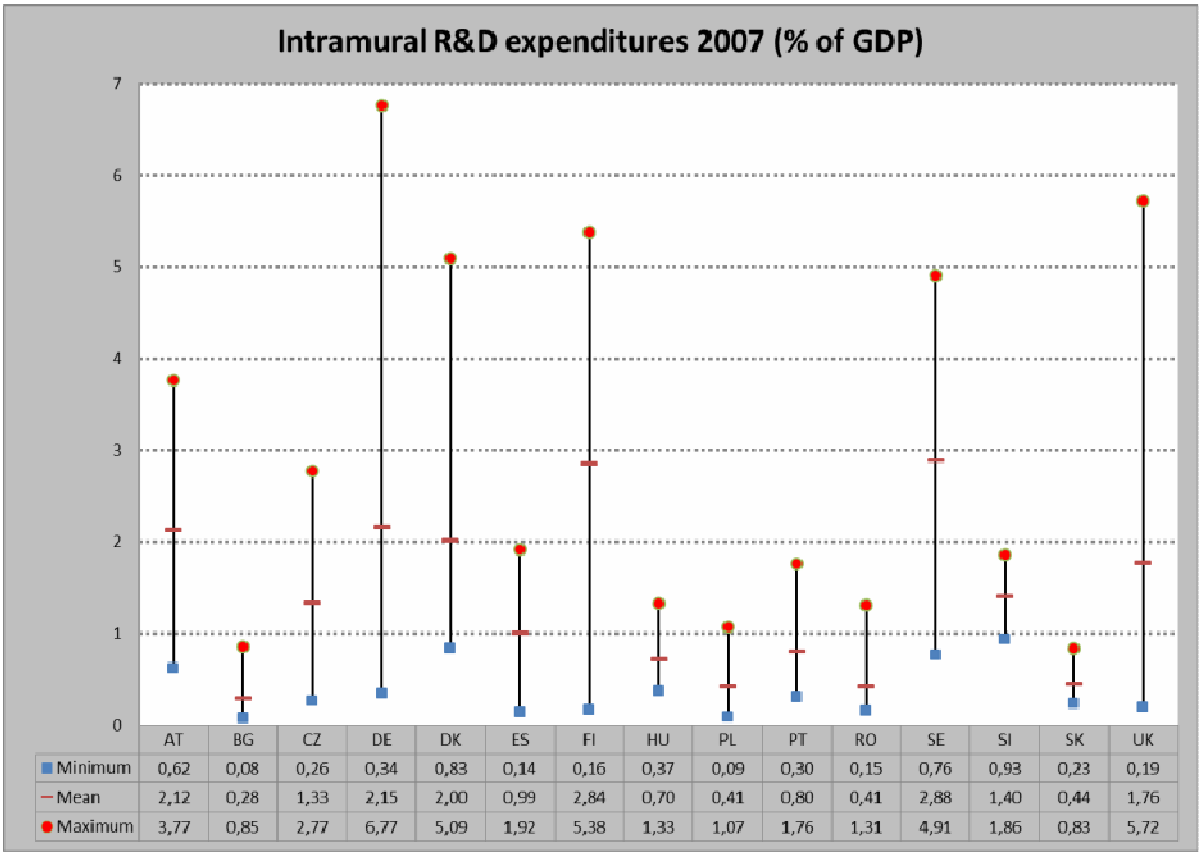


Figure 42. Indicator – Population aged 25-64 with tertiary education

Total intramural R&D expenditures

Theme: 0707 ECONOMY, LABOUR FORCE. Innovation
Policy relevance: This indicator measures the future orientation of the regional economy in terms of investments in R&D. This support to innovation capacity is considered as a key driver of regional growth.
Desired direction of change: Generally each region should have a minimum level of R&D activities, either at public research institutes, or at private companies. Increase is desired until this minimum level is reached.
Description: Regions considered as high-tech regions in Europe clearly appear (for instance, southern Germany, England, Scandinavia) in the map as regions gaining the highest intramural R&D expenditures. Percentages are generally lower in new EU Member States compared to the old ones. The value ranges are great for Germany, UK, Finland and Sweden, once again illustrating the steep divide between high-tech regions and low-tech regions; only for Bulgaria, Hungary and Slovakia rather small regional variations within the countries can be detected (Figure 43).

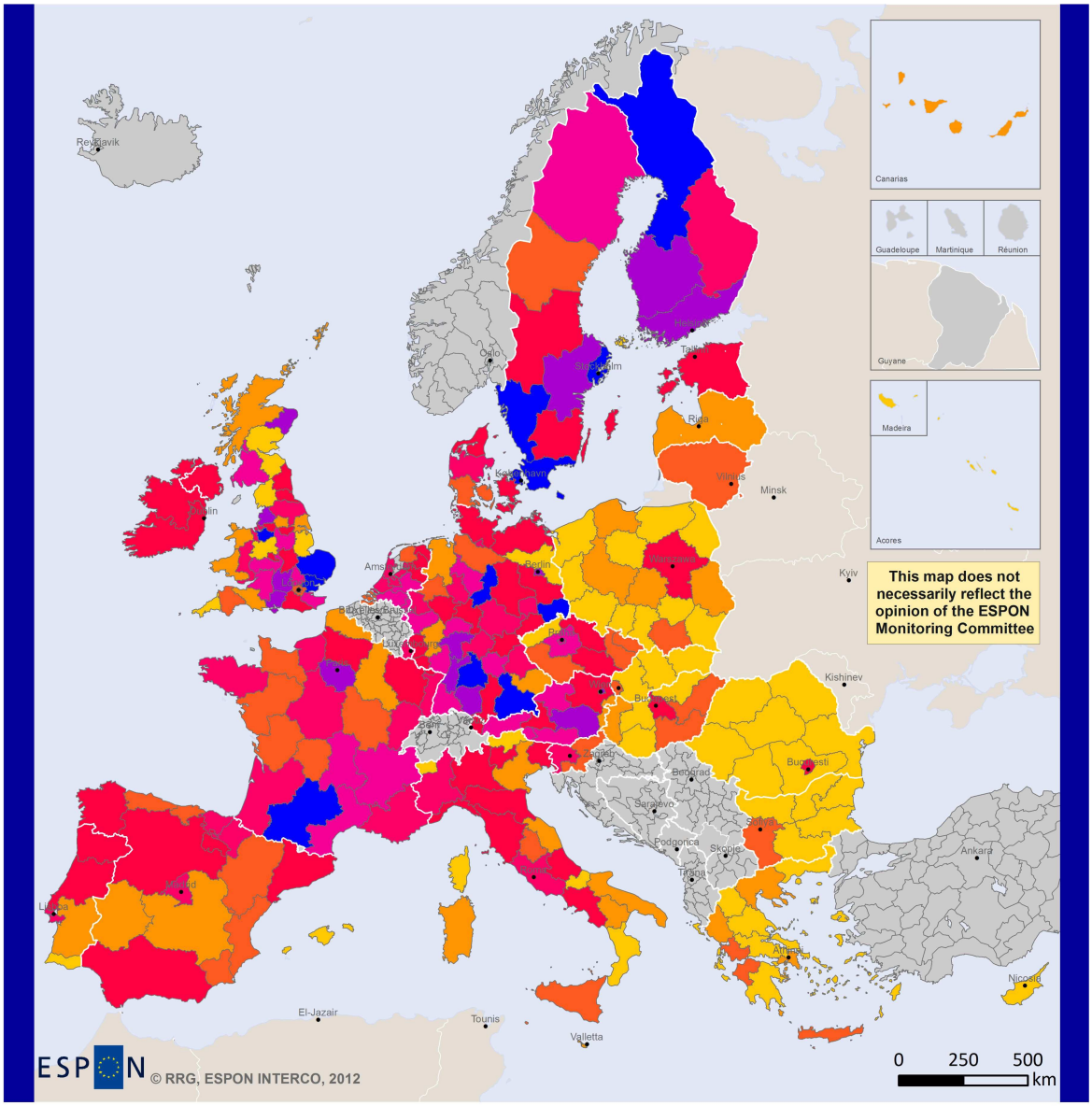


	AT	BG	CZ	DE	DK	ES	FI	HU	PL	PT	RO	SE	SI	SK	UK
Minimum	0,62	0,08	0,26	0,34	0,83	0,14	0,16	0,37	0,09	0,30	0,15	0,76	0,93	0,23	0,19
Mean	2,12	0,28	1,33	2,15	2,00	0,99	2,84	0,70	0,41	0,80	0,41	2,88	1,40	0,44	1,76
Maximum	3,77	0,85	2,77	6,77	5,09	1,92	5,38	1,33	1,07	1,76	1,31	4,91	1,86	0,83	5,72

Figure 43. Intramural R&D expenditures – Minima, mean and maxima

Total intramural R&D expenditures (2007)

Territorial objective	*Change direction*	*Gaps*	*Years available*
Innovative territories	Increase desired until needs are met	Missing data: BE, CH, IS, LI, NO, TR, Western Balkans, French overseas dep.	2007



in % of GDP		
0,08 - 0,50	1,51 - 2,00	No data
0,51 - 0,75	2,01 - 3,00	
0,76 - 1,00	3,01 - 4,00	
1,01 - 1,50	4,01 - 6,77	

Indicator definition

R&D expenditures at universities/public research organizations

Sigma convergence

Figure 44. Indicator – Intramural R&D expenditures.

Employment rate

Theme:

0702 ECONOMY, LABOUR FORCE. Employment, Unemployment

Policy relevance:

This indicator measures the actual participation of working age population in economic regional activities and in producing net added value. High employment rates reflect a vital quality of the labour markets which constitutes a favourable context for innovative territories.

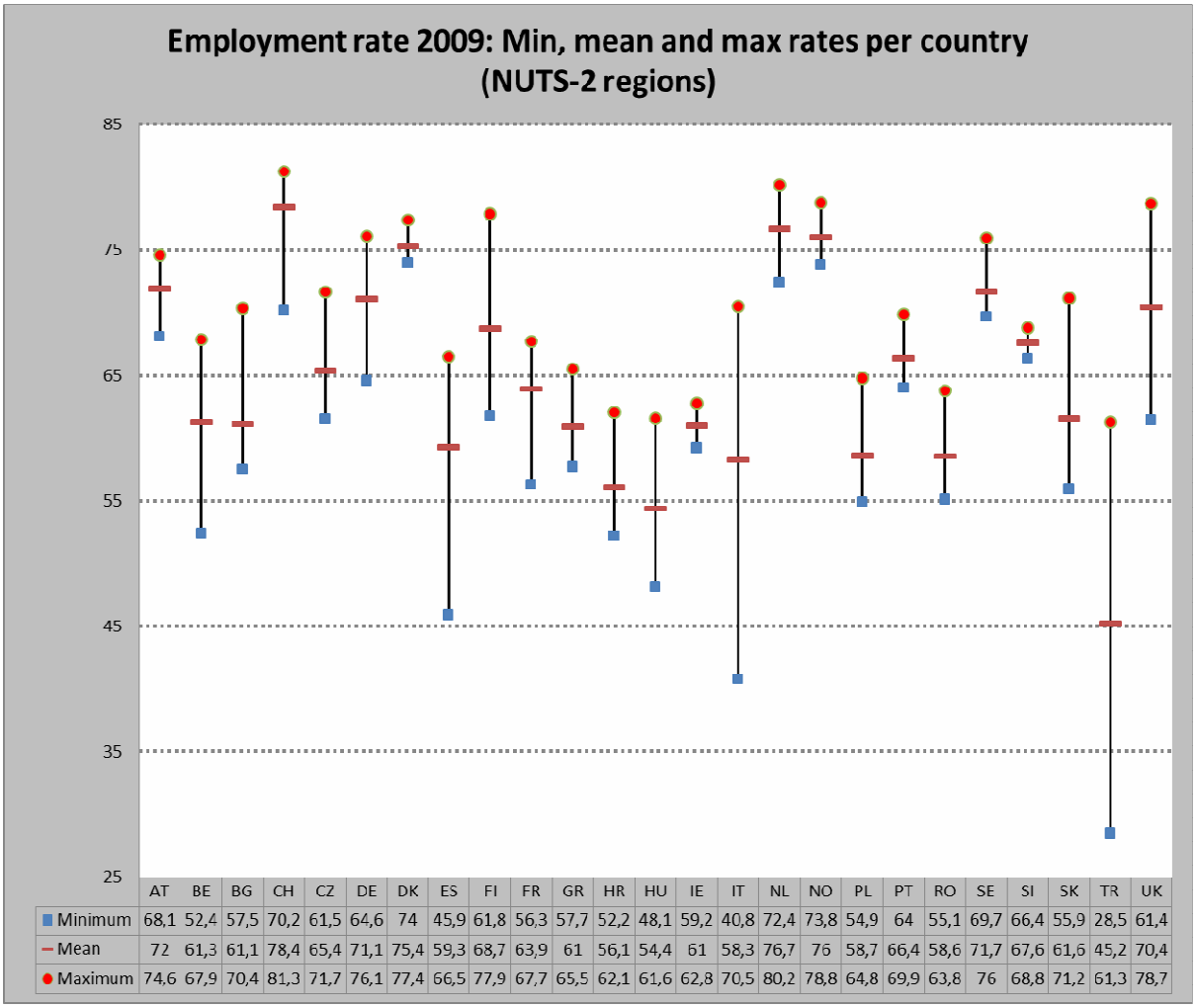
Desired direction of change:

Basically a full employment of population should be achieved (100% employment rate). Regions with lower employment rates should catch up faster than the other regions.

Description:

Employment rates significantly differ across Europe. As tendencies the rates are lower the farther south and the farther east a region is located, i.e. resulting in lowest employment rates in southern Spain, southern Italy and Turkey. In contrast, highest employment rates are found in Scandinavia, Benelux, UK, Germany and Switzerland. The map and the chart also suggest that there are great disparities within individual countries itself (for instance, Italy, Turkey, Spain) (Figure 45).

Since 2007, these disparities even increase over all European NUTS 2 regions (Figure 46), caused by two combined effects: first, regions with already high employment rates even managed to increase these rates even more. Second, many regions with low or intermediate employment rates experiences a drop in these rates (negative developments of employment). Taking these two trends together, regional disparities in Europe widened for employment in the period 2007-2010.



	AT	BE	BG	CH	CZ	DE	DK	ES	FI	FR	GR	HR	HU	IE	IT	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
Minimum	68,1	52,4	57,5	70,2	61,5	64,6	74	45,9	61,8	56,3	57,7	52,2	48,1	59,2	40,8	72,4	73,8	54,9	64	55,1	69,7	66,4	55,9	28,5	61,4
Mean	72	61,3	61,1	78,4	65,4	71,1	75,4	59,3	68,7	63,9	61	56,1	54,4	61	58,3	76,7	76	58,7	66,4	58,6	71,7	67,6	61,6	45,2	70,4
Maximum	74,6	67,9	70,4	81,3	71,7	76,1	77,4	66,5	77,9	67,7	65,5	62,1	61,6	62,8	70,5	80,2	78,8	64,8	69,9	63,8	76	68,8	71,2	61,3	78,7

Figure 45. Employment rate 2009 – minima, mean and maximum by country

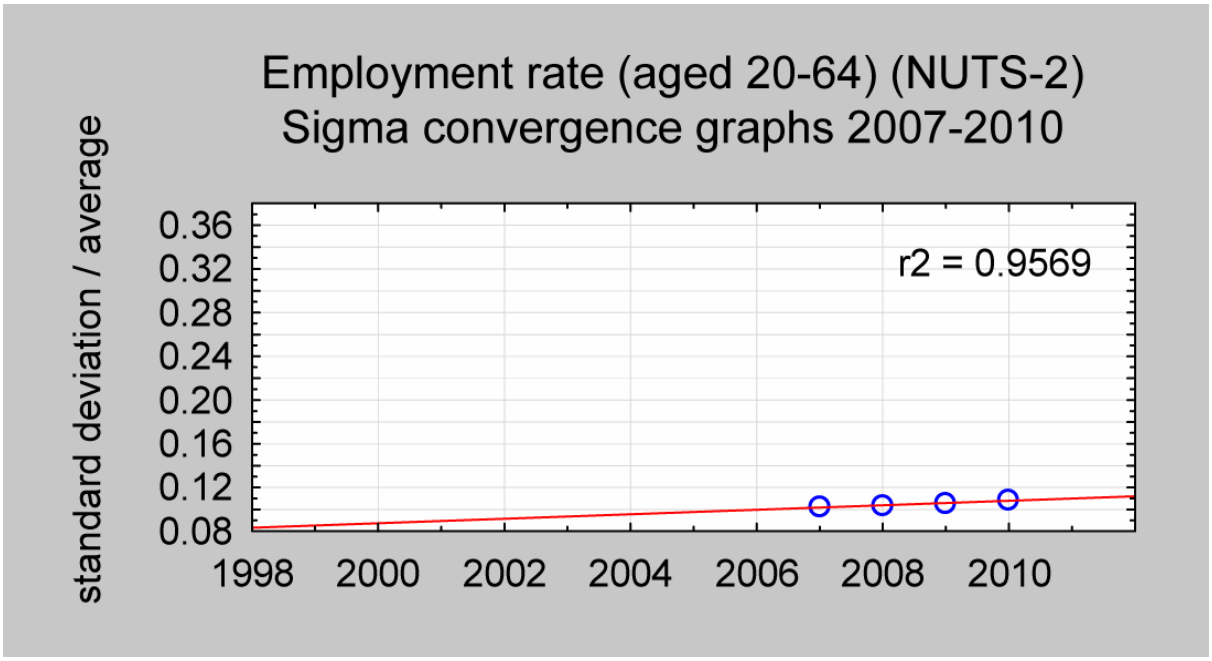


Figure 46. Employment rate – development of disparities 2007-2010

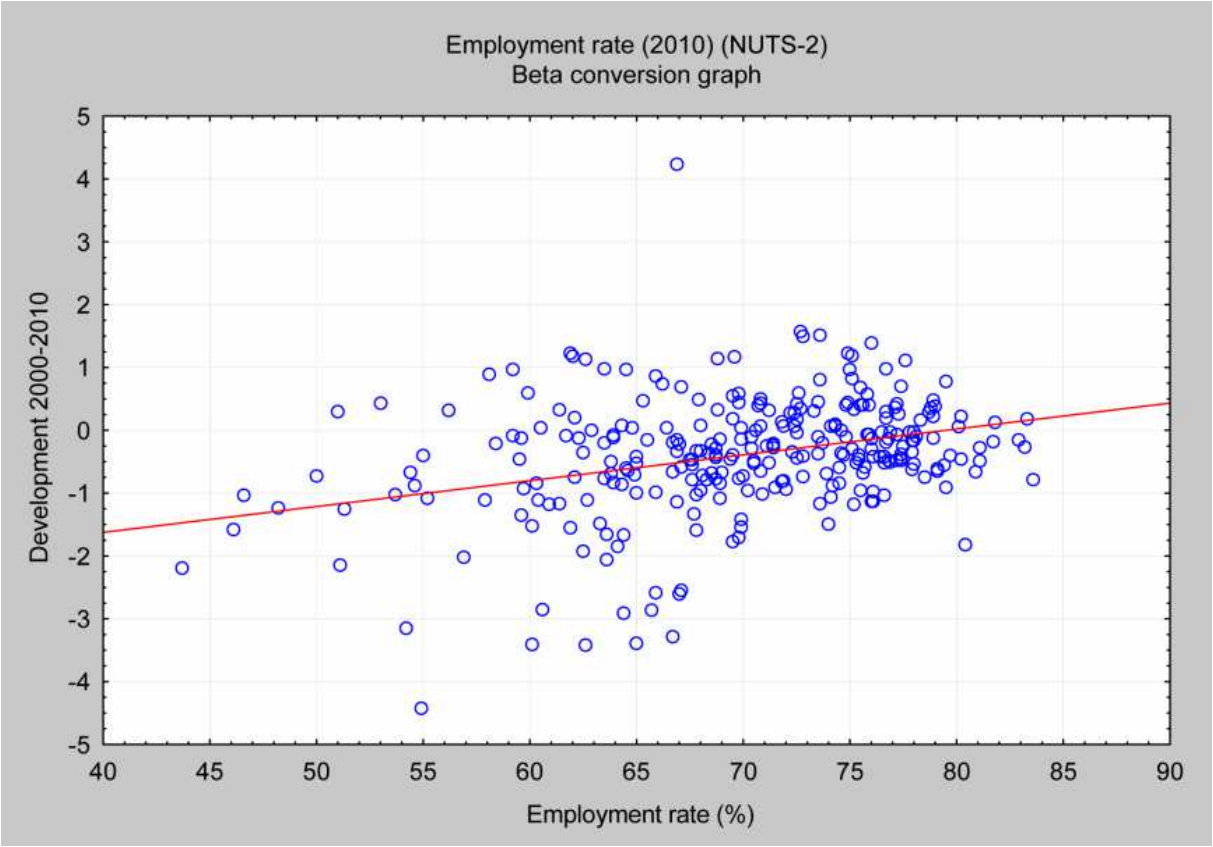
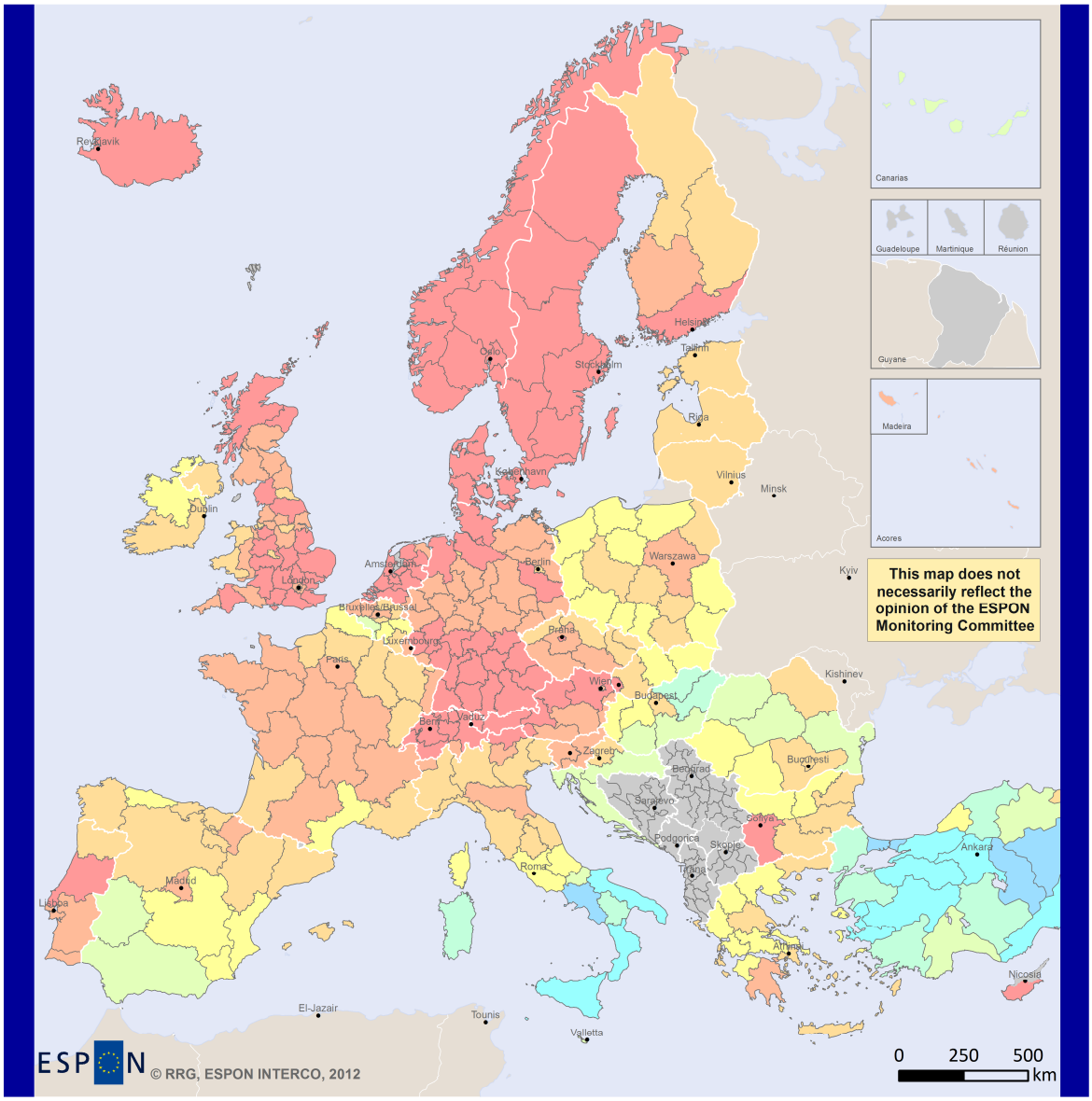


Figure 47. Employment rate – beta convergence

Employment rate (2009)

0 7 0 2 e m p 2 0 6 4 _ 2 0 0 9 n 2 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Innovative territories	Increase desired with lagging regions catch up faster	Missing data: LI, Western Balkans, French overseas departments	1999-2009



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Regional level: NUTS 2
Data source: Eurostat, Regio database, 2011
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in %

33 - 35	56 - 60	No data
36 - 40	61 - 65	
41 - 45	66 - 70	
46 - 50	71 - 75	
51 - 55	76 - 84	

Indicator definition

Percentage of employed people on all people aged 20-64.

Sigma convergence

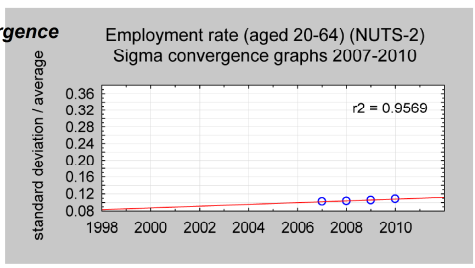


Figure 48. Indicator – Employment rate 20-64 years

Summary

What are the territorial disparities of the indicators selected for the territorial objective of innovative territories? And how have these indicators developed over the last decade?

Concerning ***tertiary education***, convergence trends towards cohesion at regional level could be observed since lagging regions developed stronger than already good performing regions; differences within countries are rather small compared to difference between countries, revealing fundamental differences in the national education systems.

Due to poor data availability, no time series analysis was possible for ***intramural R&D expenditures***. Great disparities exist even within high-tech regions and rural regions within countries, but there are obvious big gaps still existing between the old and the new EU Member States.

Gaps in ***employment*** widened since 2007, because good performing regions improved their employment rates on the expense of lagging regions, which even experienced a further fall in employment, making existing disparities permanent between the East European and south European countries on the one hand, and the remaining parts of Europe on the other hand.

Overall results for the territorial objective on innovative territories show that there is no automatism of improving levels of tertiary education and employment rates. Quite the opposite, trends of convergence for one indicator does not necessarily imply same development trends for the other indicator. For entire Europe, this led to a convergence in tertiary education, but to widened gaps in employment rates.

C.3.3. Fair access to services, markets and jobs

"*Fair and affordable accessibility to services of general interest, information, knowledge and mobility are essential for territorial cohesion. Providing services and minimising infrastructure barriers can improve competitiveness and the sustainable and harmonious territorial development of the EU*". With this statement, TA 2020 gives a central role to service provision and accessibility in a broader sense, since they are considered as essential for territorial connectivity and integration. The objective is to make sure that every territory benefit from well-being standards and from equal development potentials, especially for remote, isolated or sparsely populated areas.

Seven indicators are proposed as territorial cohesion indicators under this objective:

- Access to compulsory schools
- Access to hospitals
- Access to grocery services
- Access to universities
- Accessibility potential by road
- Accessibility potential by rail
- Accessibility potential by air

These indicators are dedicated to measure fair access to basic (public) services (compulsory schools, hospitals, grocery services, universities), and represent context indicators for accessibility and market potential and locational advantages by different modes of transport (accessibility potential by road, rail and air).

Unfortunately, data on the first four indicators (access to …) are so far not available at regional level for entire ESPON space; from SILC survey such data are available, however, the regional subdivision by countries is not coherent. While for all countries SILC data are subdivided by degree of urbanisation (three categories, i.e. densely populated areas, intermediate areas and thinly populted areas), a regional differentiation into NUTS regions is unfortunately inconsistent. Some of the SILC countries are subdivided into NUTS 1 entities (e.g. Ireland, Baltic States, Denmark, Belgium, Poland, Slovakia, Austria, Italy, Greece and Spain), for other countries a NUTS 2 subdivsion is implemented (Czech Republic, Finland, France, Spain) while for a third group of countries no subdivision into NUTS regions is available (like Germany, Sweden, UK). Given these data restrictions an analysis based on NUTS entities and on time-series cannot be presented.

The ESPON TRACC project is currently being calculating such “access to …” indicators, but only for selected case study regions. Results of ESPON TRACC are not yet available, however, the potentials of such indicators are exemplified in the chapter on wishlist indicators (B.4.1. Wishlist).

The other three potential accessibility indicators are available at NUTS 3 level for entire ESPON space, but so far only for two points in time, i.e. 2001 and 2006, taken from earlier ESPON projects. The ESPON TRACC project is currently working to update these indicators for 2011, but results of these calculations are not yet available at the time of writing up INTERCO Final Report. In any case, even though only two points in time are available so far, time series analysis (sigma convergence) was performed to retrieve at least basic development trends of the accessibility indicators.

Access to compulsory schools

Theme:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures fair access to basic education as one of the key public services. Good access to basic education facilities helps to benefit equally from well-being standards as it is essential for territorial cohesion.

Desired direction of change:

Generally the higher the access to such facilities is the better it is for kids, families and the public as a whole; however, a minimum level should be maintained avoiding extreme long trip lengths for school kids, even in remote and peripheral areas.

Description:

Even though the majority of interviewees reported easy or very easy access to compulsory schools, Figure 49 nonetheless shows remarkable differences in the access to compulsory schools, both by country and by type of region. At country level, roughly there are three groups of countries with low proportion of concerned population (less than 10% of population facing difficulties, i.e. Cyprus, Finland, Sweden, Netherlands, France, UK), medium proportion (10% up to 20%, i.e. Belgium, Denmark, Ireland, Luxembourg, Greece, Czech Republic, Hungary, Slovenia, Estonia, Lithuania, Austria and Malta), and high proportion of population facing severe difficulties in access to compulsory schools (20% up to 30 %, remaining countries).

Second, there are also distinct differences by type of region. For most countries, access is least difficult in densely populated areas, followed by intermediate areas and is most difficult in sparsely populated rural areas. Exceptions from this rule are Malta and the UK, where access in urbanised areas is most problematic, as well as Belgium, Hungary and Portugal where interestingly access to schools in intermediate regions is most difficult. Figure 49 furthermore shows that the differences by type of region are significant, reaching up to 15 percentage points (Germany, Poland, Bulgaria).

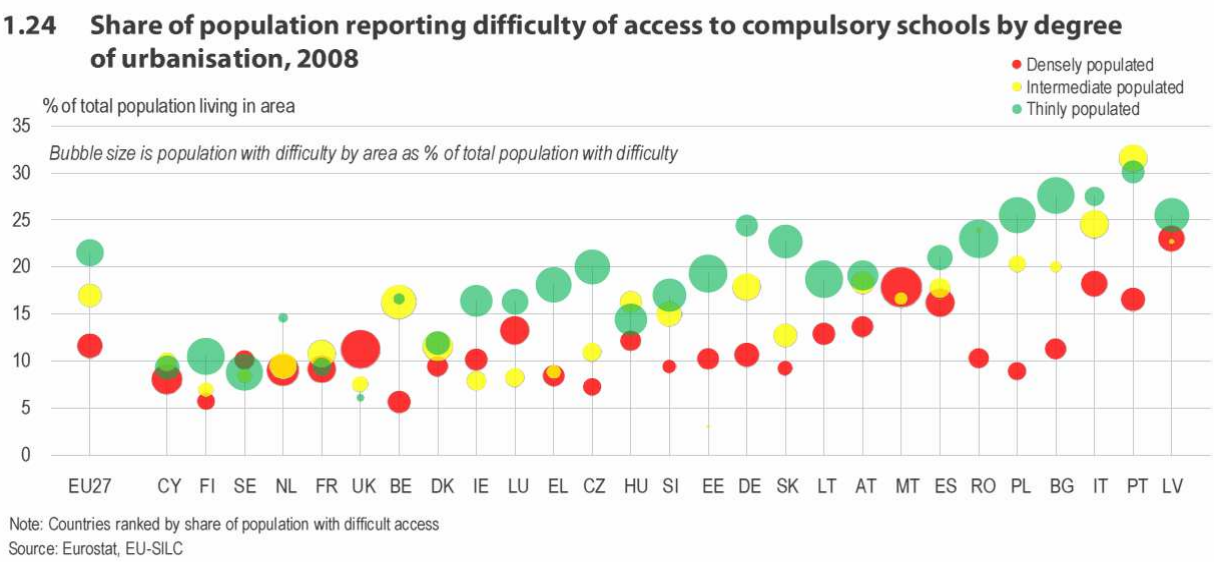


Figure 49. Access to compulsory schools in 2008 – proportion of population reporting access difficulties (5th Cohesion Report, 97)

Access to hospitals

Themes:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures fair access to health care facilities representing one of the basic public services. Fair access for all population groups helps to benefit equally from well-being standards as it is essential for territorial cohesion.

Desired direction of change:

Generally the higher the access to such facilities is the better it is for the public with the view to care best about health; however, a minimum level should be maintained, even in remote or peripheral areas.

Description:

As Figure 50 illustrates, differences in access to primary health care services in Europe are differing significantly. In countries like France, UK, Netherlands, Luxembourg, Belgium or Germany, only a small proportion of up to 10 percent of the population face difficulties, with only small differences by type of region. In other countries such as Sweden, Hungary, Finland or Cyprus, the differences between the type of regions are also small, but the proportion of population facing difficulties is generally higher with up to 20 percent. For the other countries, 30 percent of the proportion or even up to 40 percent of population (Romania, Italy, Latvia) face severe problems in access to primary health care services, mainly in sparsely populated rural areas.

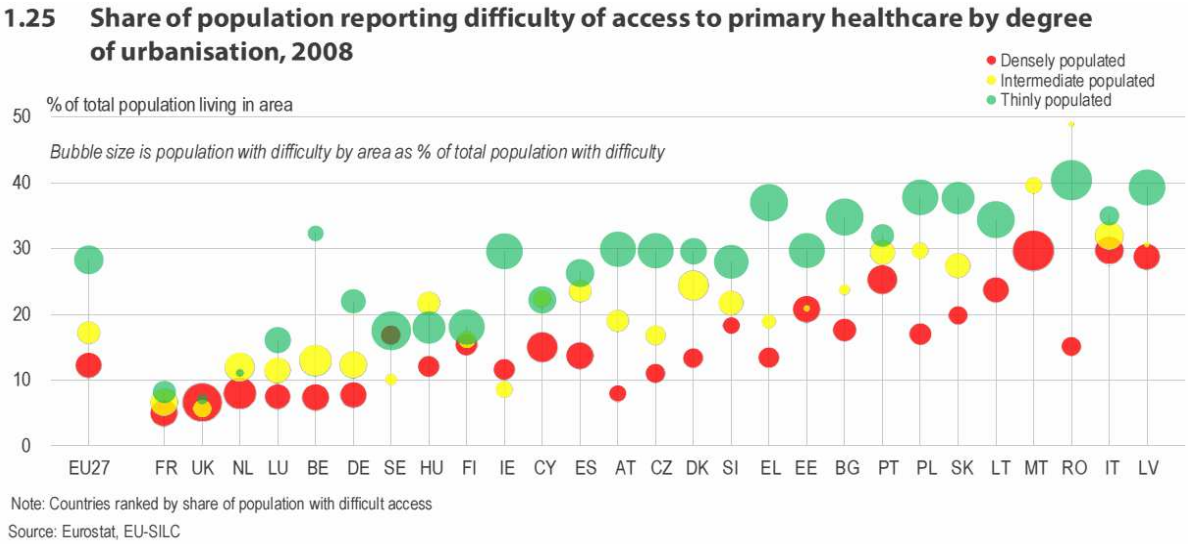


Figure 50. Access to primary health care services in 2008 – proportion of population reporting access difficulties (5th Cohesion Report, 97)

Access to grocery services

Themes:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures fair access to grocery services representing one of the basic public services. Fair access for all population groups helps to benefit equally from well-being standards as it is essential for territorial cohesion.

Desired direction of change:

Generally the higher the access to such facilities is the better it is for the public with the view of short distance trips to stores; however, a minimum level should be maintained, even in remote or peripheral areas.

Description:

Figure 51 show great differences in difficulty of access to grocery services. Generally, as expected, access in densely populated areas is easiest, followed by intermediate areas and thinly populated areas experiencing biggest problems in access to such stores. While this is a general pattern in all countries, regional disparities within the countries are significant. In many countries such as Latvia, Lithuania, Ireland or Belgium access in urban areas is reported much easier compared to its rural counterparts. Rural areas in Belgium seem to have the biggest access problems. Fair access to grocery stores for all types of regions offer Finland, Slovakia, Hungary, and to some degree, also Denmark, Czech Repbulic and Poland. In countries like Spain, Belgium or Austria also intermediate regions suffer from poor access to a certain extent.

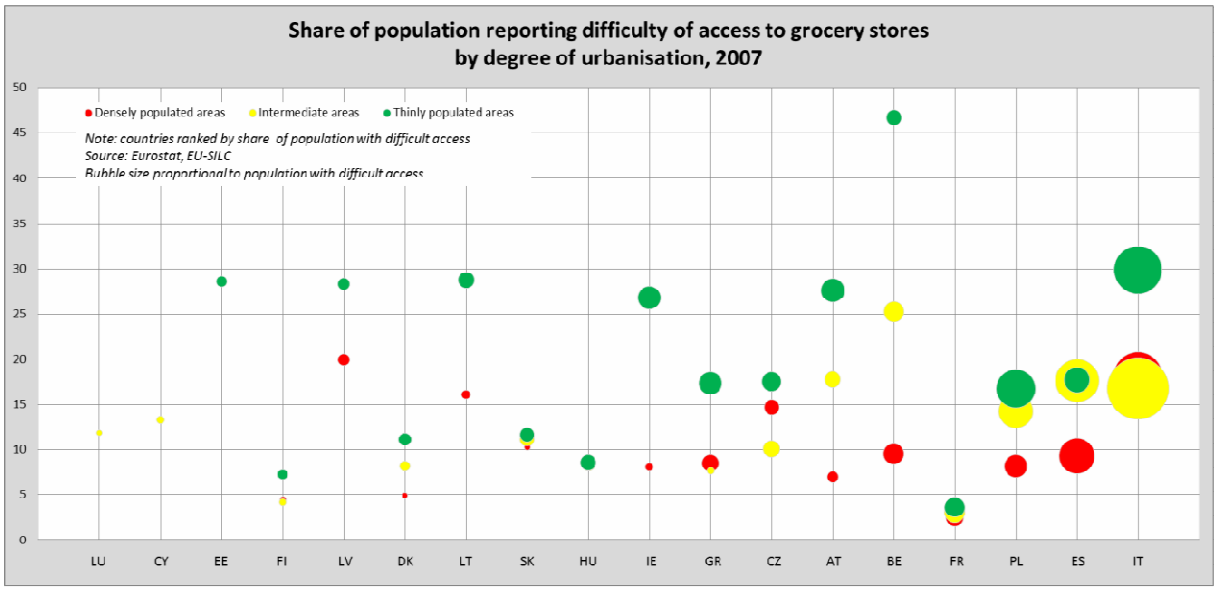


Figure 51. Access to grocery services in 2007 – proportion of population reporting access difficulties (EU-SILC survey).

Accessibility potential by road

Themes:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures market potential and locational advantages of a region. To benefit equally from these development potential is essential for territorial cohesion (context indicator).

Desired direction of change:

A minimum level of potential accessibility is desired. Regions with less than 50% of European average should catch up faster.

Description:

The regions in Belgium, the Netherlands and in the western parts of Germany have the highest accessibility values in Europe leading partly to a level more than twice the European average. But also regions in northern and eastern parts of France, in the south-east of England, in Switzerland, the western parts of Austria and the northern parts of Italy have very good accessibility by road. In all these regions the combination of good road infrastructure in form of dense motorways and high concentration of population leads to these favorite positions. Accessibility by road decreases towards regions located outside the core. Lowest accessibility by road is found in the northern regions of the Nordic countries. Also most regions of the Baltic States, Bulgaria, Romania and Greece have very low potential accessibility.

The disparities within countries are remarkable (Figure 52), and are highest in France, Germany, Italy and the UK. Even for those countries with generally high accessibility, there are regions with below-average (Austria, Czech Republic, Germany, Italy, Slovakia, and the UK).

In the period 2001-2006, disparities in potential accessibility by road slightly decreased for entire Europe (Figure 53); however, when differentiating by type of regions, the situation as not that clear: first, remote regions (intermediate regions and predominantly rural regions) have by far higher disparities compared to urban regions or regions located close to a city. Moreover, while disparities for urban regions stagnated between 2001 and 2006, disparities even increased for remote rural regions, i.e. these regions gained real losses in the relative accessibility potential.

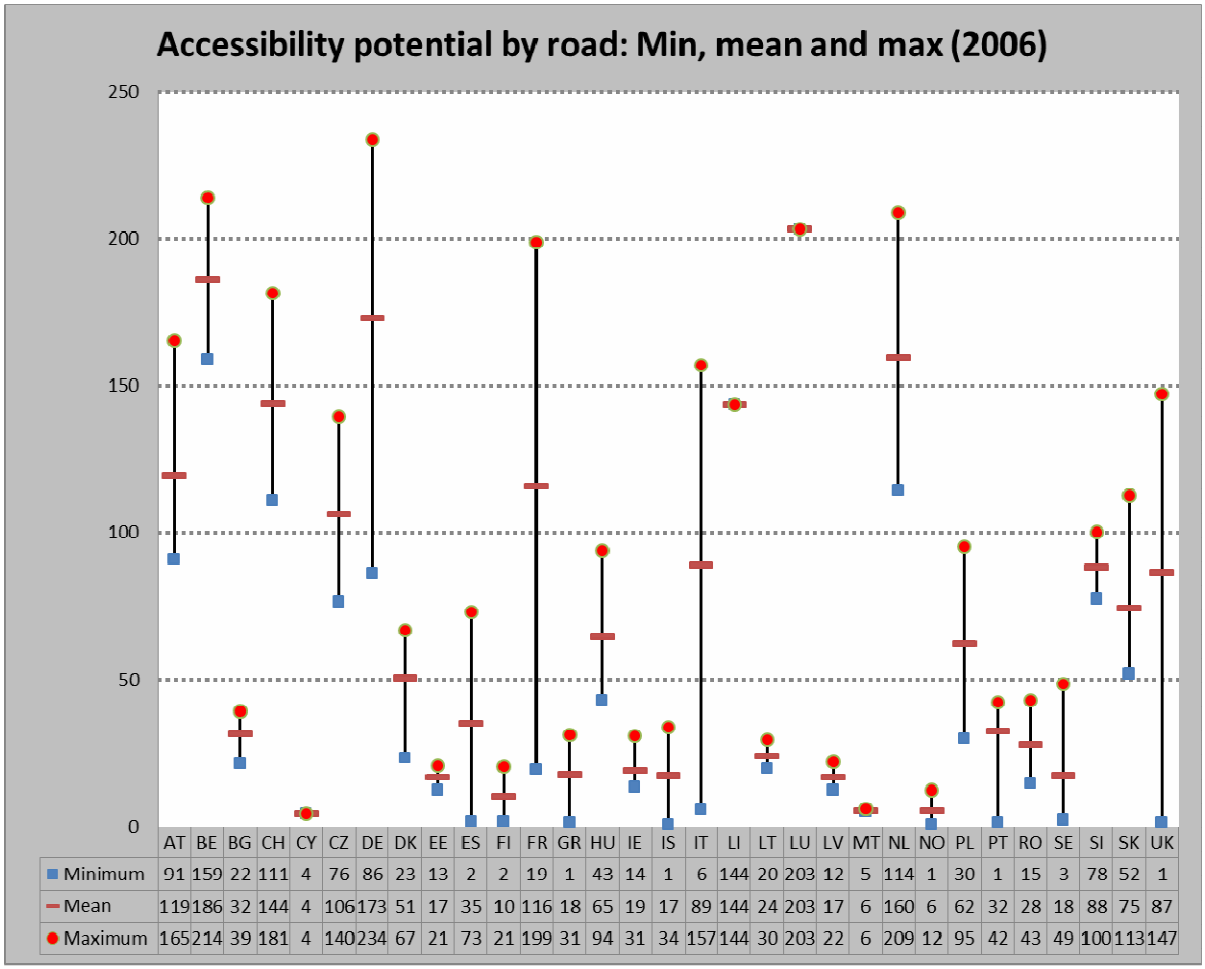


Figure 52. Accessibility potential by road – Min, mean and max

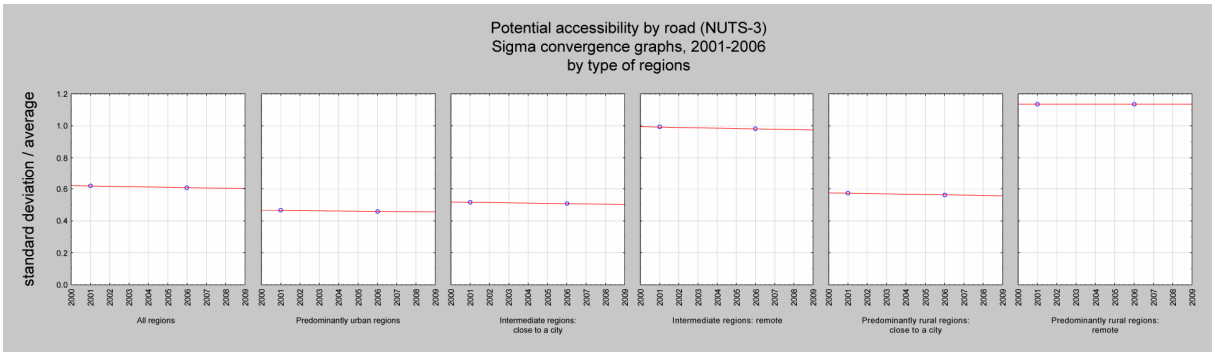
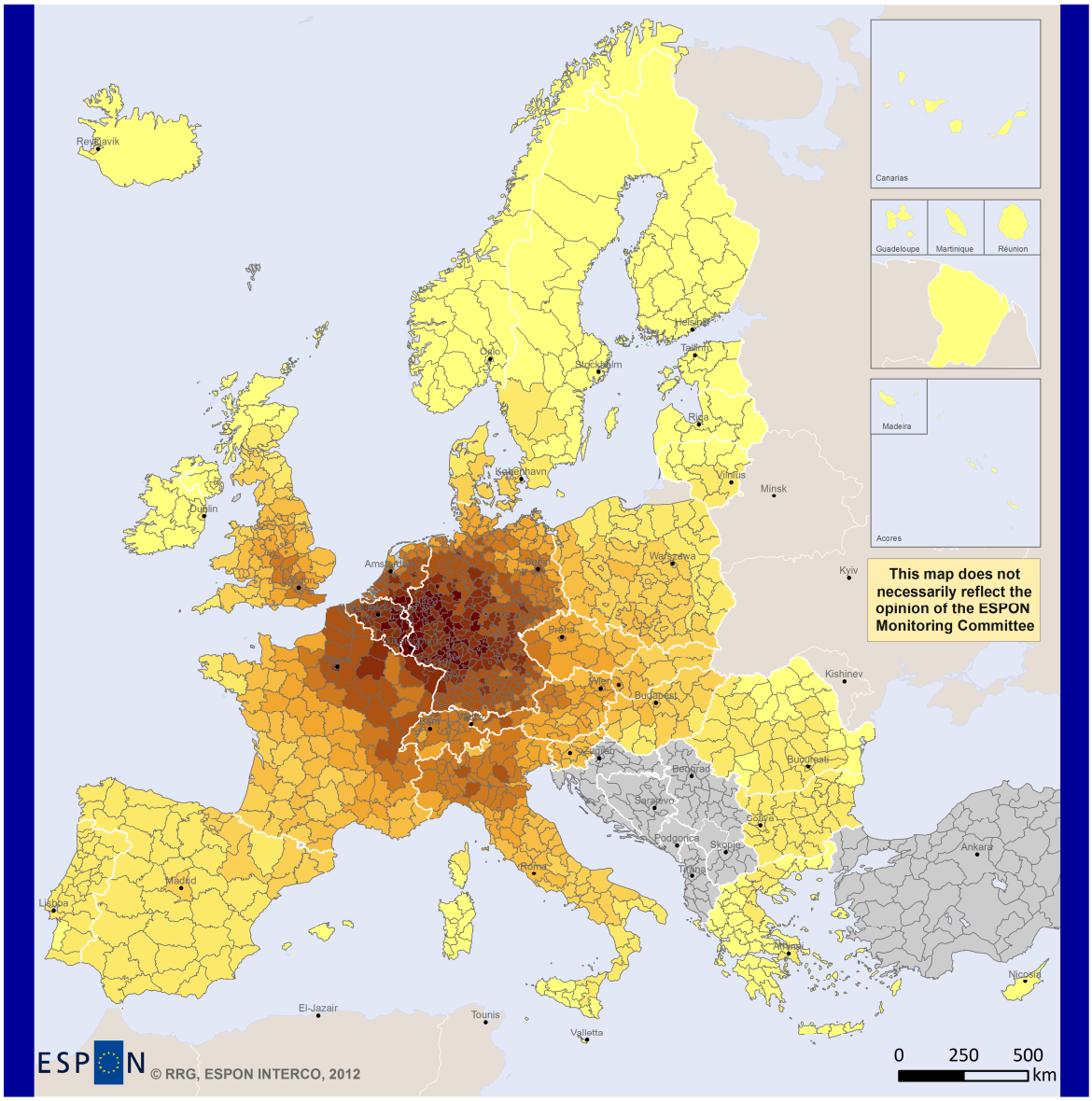


Figure 53. Accessibility potential by road – development of disparities 2001-2006

Accessibility potential by road (2006)

0 3 0 3 a c c p o t r o 2 0 0 6 n 3 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Fair access to services, market and jobs	Minimum level desired; regions <50% Europ. ave. catch up faster	Missing data for TR and Western Balkans	2001, 2006



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Regional level: NUTS 3
Data source: ESPON Database, 2011
S&W Accessibility Model
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EU27 = 100

1 - 25	126 - 150	No data
26 - 50	151 - 175	
51 - 75	176 - 200	
76 - 100	201 - 234	
101 - 125		

Indicator definition
Reachable population weighted by distance

Sigma convergence

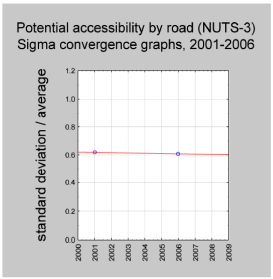


Figure 54. Indicator – Accessibility potential by road

Accessibility potential by rail

Theme:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures market potential and locational advantages of a region. To benefit equally from these development potential is essential for territorial cohesion (context indicator).

Desired direction of change:

A minimum accessibility level is desired. Regions with less than 50% of European average should catch up faster.

Description:

Regions in the European core have the highest values. However, instead of forming a plateau of high accessibility like for roads, regions with top accessibility for rail are forming corridors along high-speed rail links. High-speed rail also brings very high accessibility to regions outside the European core, for instance in France to Tours and Lyon and Marseille or in Germany to Berlin. Below average accessibility by rail can be found in Ireland, Spain, Portugal, southern Italy and most regions of the new Member States. Lowest accessibility by rail is located in the northern parts of the Nordic countries, the Baltic States and most regions of Romania, Bulgaria and Greece.

Again there are significant disparities within countries (Figure 55), in particular for those countries which have high-speed train services (Germany, France, Belgium, and Italy). For many countries even the regions with highest accessibility are clearly below the European average, often even clearly below 50% of the European average (Bulgaria, Baltic States, Norway, Portugal, Greece, or Finland).

For all regions in Europe, disparities remained stable between 2001 and 2006 (Figure 56). An analysis by type of region, however, revealed interesting details: while disparities for urban regions and for predominantly rural regions close to a city increased, there was a clear trend towards convergence for intermediate remote regions and for predominantly rural remote regions, but of course disparities for remote regions remained highest compared to the other types of regions. Increases in disparities for urban regions may be counter-intuitive at a first glance; however, recalling that not all urban regions were connected to the high-speed rail networks at the same time, the accessibility of urban regions without high-speed services falls behind those urban regions with high-speed services.

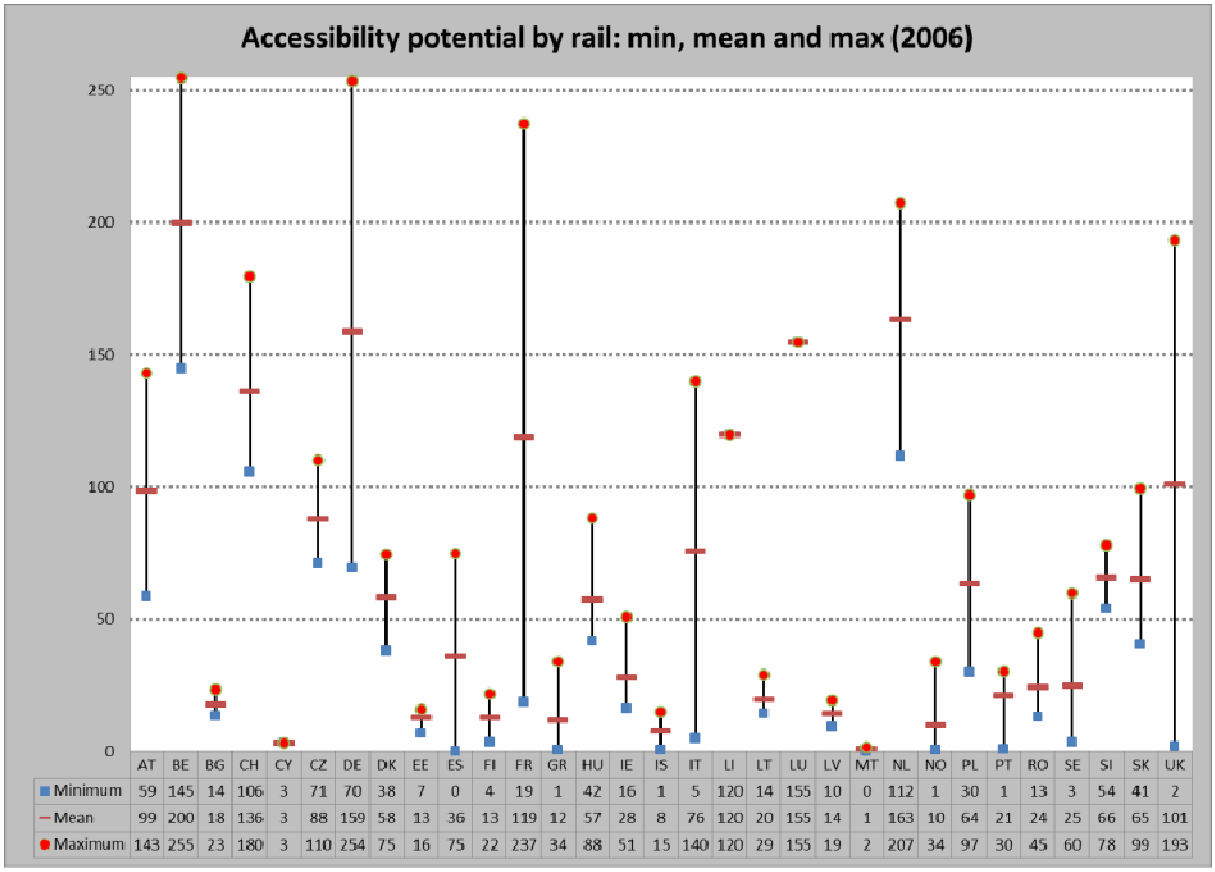


Figure 55. Accessibility potential by rail – min, mean and max

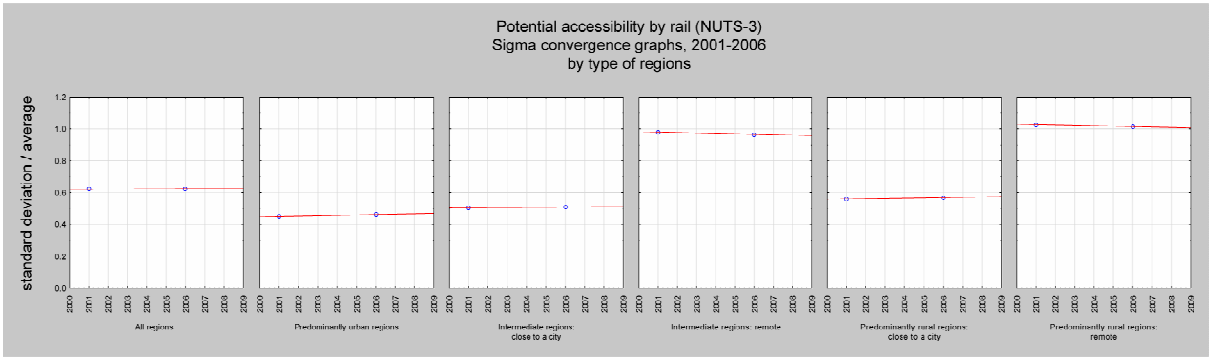
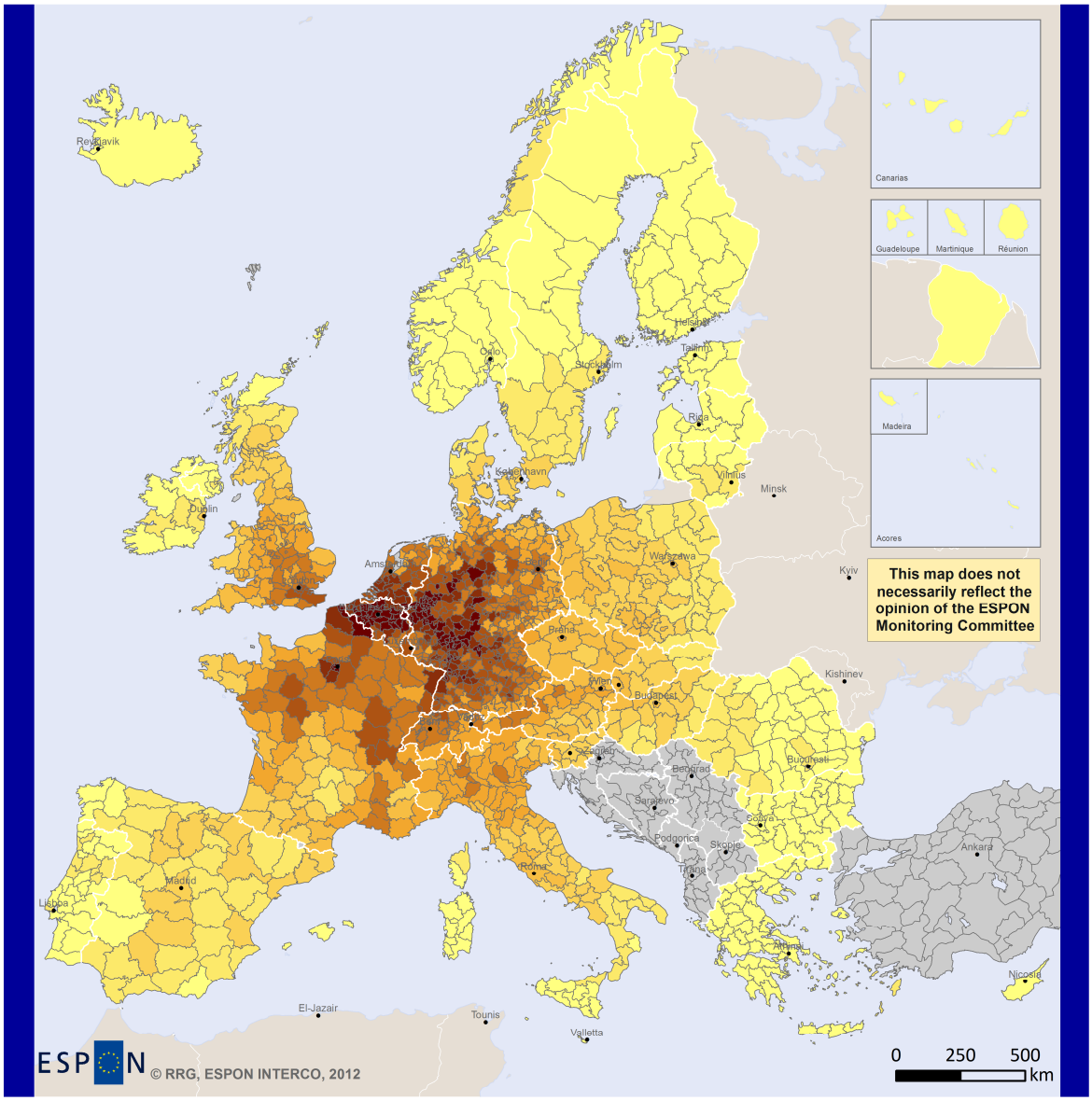


Figure 56. Accessibility potential by rail – development of disparities 2001-2006

Accessibility potential by rail (2006)

0 3 0 3 a c c p o t r a 2 0 0 6 n 3 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Fair access to services, market and jobs	Minimum level desired; regions <50% Europ. ave. catch up faster	Missing data for TR and Western Balkans	2001, 2006



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EU27 = 100

0 - 25	126 - 150	No data
26 - 50	151 - 175	
51 - 75	176 - 200	
76 - 100	201 - 255	
101 - 125		

Indicator definition
Reachable population weighted by distance

Sigma convergence

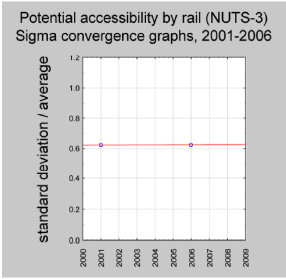


Figure 57. Indicator – Accessibility potential by rail

Accessibility potential by air

Theme:

0303 TRANSPORT, ACESSIBILITY, COMMUNICATION. Accessibility

Policy relevance:

This indicator measures the market potential and locational advantages of a region. To benefit equally from these development potential is essential for territorial cohesion.

Desired direction of change:

A minimum accessibility level is desired. Regions with less than 50% of European average should catch up faster.

Description:

Regions with major airport hubs and their surroundings clearly appear as those regions with highest accessibilities. In most cases these are the capital city regions, plus selected other agglomerations. The fall in accessibility towards the other regions is remarkable in all countries, so that the biggest visible divide is between agglomerations and rural areas (Figure 59).

Consequently the variations within all countries are rather high (Figure 58), with regions clearly above EU27 average and also regions clearly below. The disparities between the countries are in any case smaller than those within the countries.

Between 2001 and 2006, disparities for all types of regions in Europe decreased for potential accessibility by air (Figure 59). While for urban regions disparities were already lowest, they dropped even more, but also for intermediate and rural regions, both close to a city and remotely, disparities decreased significantly.

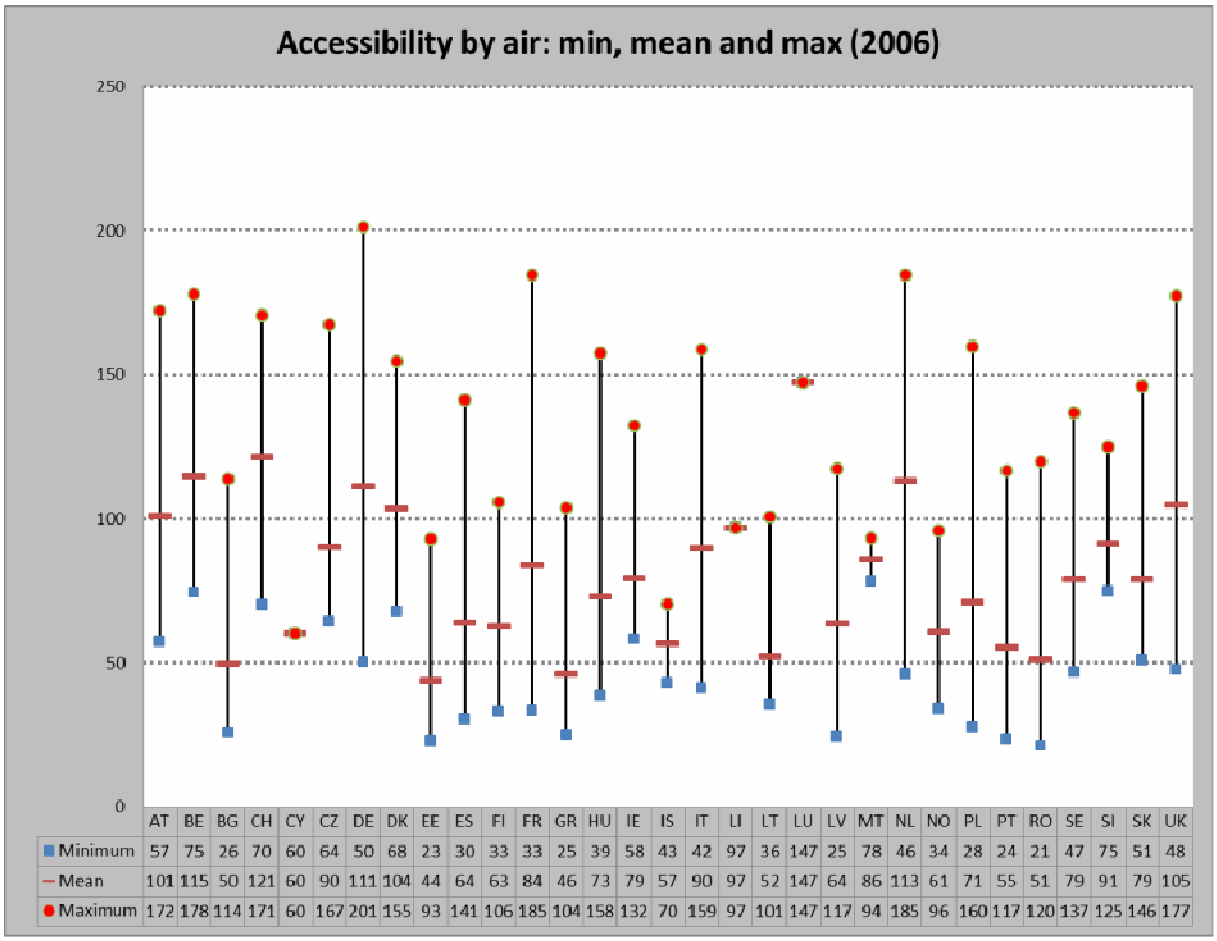


Figure 58. Accessibility by air – min, mean and max

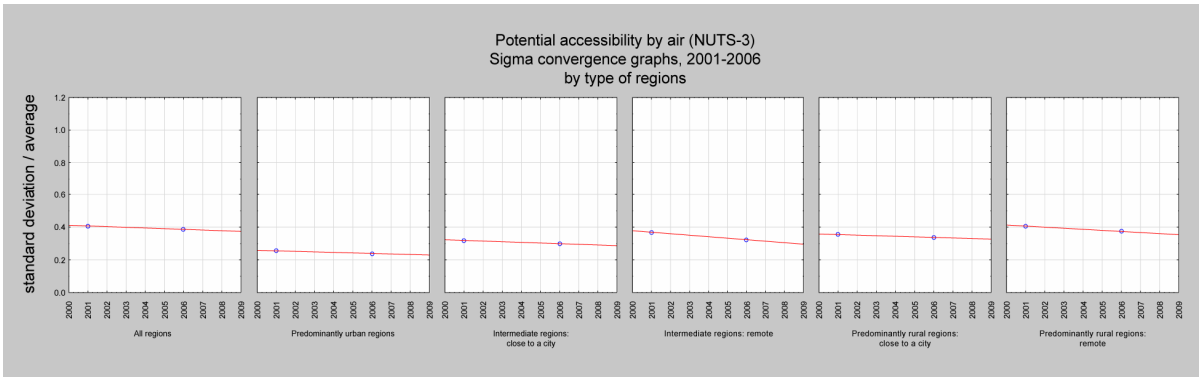
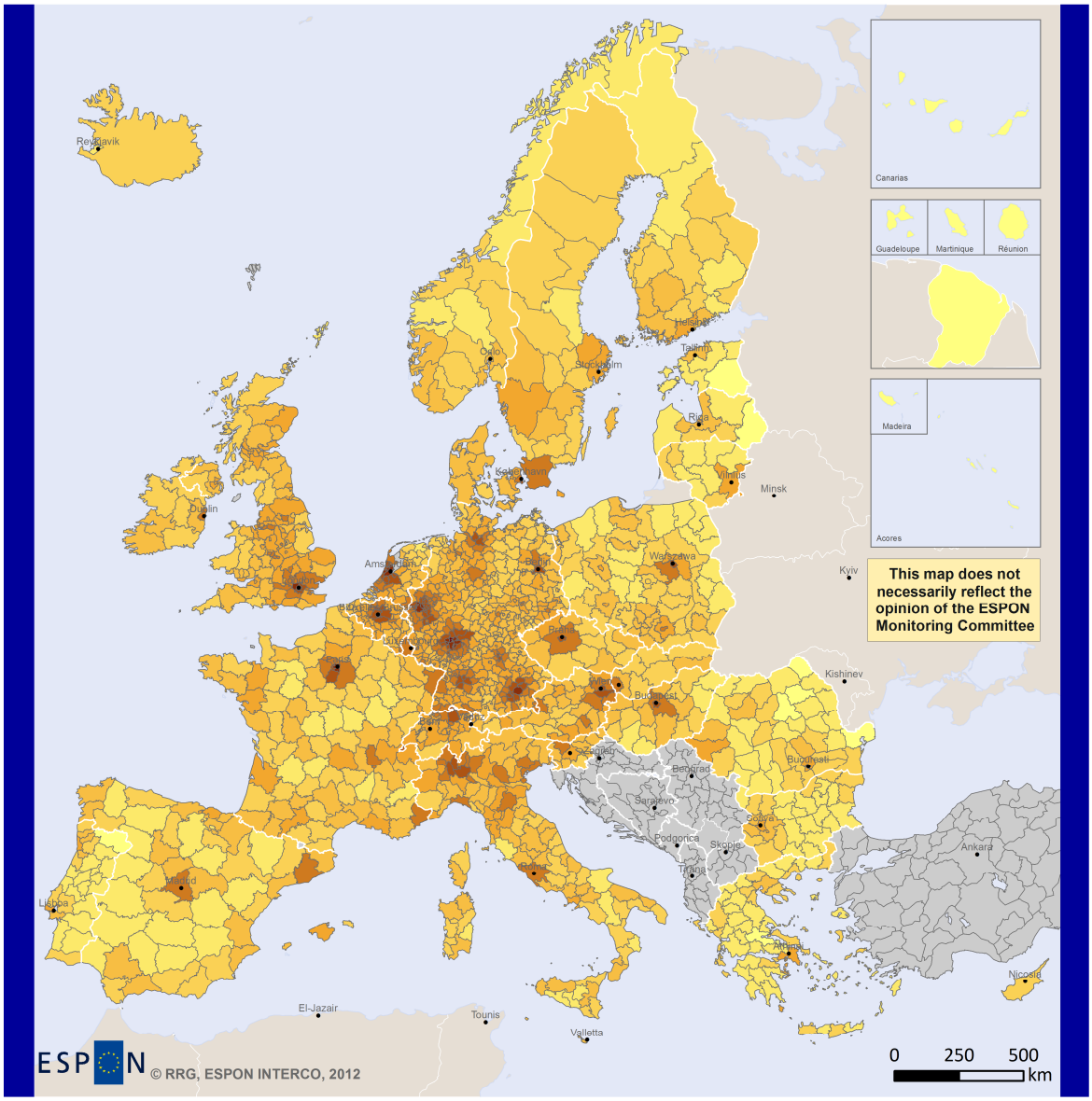


Figure 59. Accessibility by air – development of disparities 2001-2006

Accessibility potential by air (2006)

0 3 0 3 a c c p o t r a 2 0 0 6 n 3 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Fair access to services, market and jobs	Minimum level desired; regions <50% Europ. ave. catch up faster	Missing data for TR and Western Balkans	2001, 2006



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EU27 = 100

- 21 - 25
- 26 - 50
- 51 - 75
- 76 - 100
- 101 - 125
- 126 - 150
- 151 - 175
- 176 - 200
- 201
- No data

Indicator definition
Reachable population weighted by distance

Sigma convergence

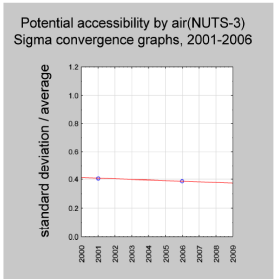


Figure 60. Indicator – Accessibility potential by air.

Summary

What are the territorial disparities of the indicators selected for the territorial objective of fair access to services, market and jobs?

Access to services has become a clear challenge during the last decade. Given the current demographic and economic trends, ensuring minimum access to services such as compulsory schools, primary health care, hospitals, grocery services, universities, etc. becomes a real challenge in rural and sparsely populated areas and in areas with other physical handicaps (mountains, islands, etc.). Partly up to 40% of the population is facing severe access problems to such services, as the 5th Cohesion Report revealed. There are not only big disparities between countries, but also within countries between urbanised, intermediate and rural regions.

Large disparities of ***accessibility potential*** by road, rail and air exist, and continue to exist in the European Union (Spiekermann and Schürmann, 2007). New transport infrastructures built between 2001 and 2006 were not able to change the overall European spatial patterns with good, moderate and low accessibility (Spiekermann and Schürmann, 2007, 25), even though in the process of EU enlargement many new EU Member States significantly improved their road networks, and thus improved their relative position. When looking at rail, the improvements of road accessibility in the new Member States were counteracted by the implementation of high-speed rail networks, linking city centres with each other.

Insofar regional deficits in competitiveness based location still remain; in different types of regions, regional disparities even increased due to the construction of high-level transport infrastructures such as high-speed rail lines or motorways, connecting urban centres with each other and bypassing rural or remote areas. The design of the trans-European transport networks (TEN-Ts) outline plans obviously has a bias towards improving the competitiveness of European agglomerations on the expense of increasing disparities between rural and remote regions and highly-accessible urban centres.

A detailed look at the modes revealed that for the ***accessibility potential by road*** one can observe a slight trend towards cohesion across all regions between 2001 and 2006; however, the development was quite heterogeneous for different types of regions: while disparities for predominantly rural remote regions increased, and stagnated for urban regions, disparities decreased for all other types of regions. Disparities remained stable in this time period for the indicator accessibility potential by rail, again with quite distinct developments for different types of regions. While disparities for urban regions and for predominantly rural regions close to a city increased, there was a clear trend towards convergence for intermediate remote regions and for predominantly rural remote regions. Results for the ***accessibility potential by air***, in contrast, was quite clear with overall trends towards cohesion for all types of regions for entire Europe.

C.3.4. Inclusion and Quality of Life

This territorial objective is certainly the most closely related to well-being. Here the issue is social but also territorial, territorial cohesion being about reducing social disparities among European territories. As mentioned in TA 2020, focus should be on underdeveloped peripheral rural and sparsely populated areas as well as on territories facing severe depopulation, where inclusive growth is a key challenge. But "*high levels of employment, a balanced distribution of benefits of economic growth and full use of labour potential*" (Europe 2020) are also important for strong areas, especially cities where wealth and disparities are concentrated. Thus, reducing poverty, promoting gender equality, facing challenge of ageing population and decreasing early leavers from education is valid for all European territories at local level.

Six indicators are proposed as territorial cohesion indicators under this objective:

- Disposable household income
- Life expectancy at birth
- Proportion of early school leavers
- Gender imbalances
- Difference in female-male unemployment rates
- Ageing index

These indicators are dedicated to measure the welfare state of a region (household income), the quality of the regional health care system and healthiness of the living environment (life expectancy at birth), the level of education (proportion of early school leavers), balanced gender relations (gender imbalances and female-male unemployment rates), and the overall age structure of a society (ageing index).

Apart from the indicator on gender imbalances and ageing index, all other indicators are currently available only at NUTS 2 or even NUTS 1 level (early school leavers). Even though NUTS level 2 or 1 already provide some territorial insights, compared to the national level, it still need to be highlighted that from a territorial perspective data availability at NUTS 3 level should be aspired.

For the first four indicators, sigma and beta convergence plots are generated to analyse the temporal development of the indicators.

Disposable household income

Theme:

0703 ECONOMY, LABOUR FORCE. Income and consumption

Policy relevance:

This indicator measures the welfare of residence population in a region and reflect the level of poverty. It is important for cohesion and inclusion that no high disparities and high levels of poverty persist.

Desired direction of change:

General increases in disposable household income are desired. Regions with less than 10,000 EUR mean disposable household income should catch up faster.

Description:

Apart from the capital cities and the big agglomerations, the disposable household income is highest in Southern Germany, Austria, England (Greater London region), France (Paris) and Northern Italy. There is furthermore a clear divide between the old and new EU Member States, with Bulgaria and Romania yielding the lowest household incomes (< 5,000 EUR). Countries with the highest disposable household income are also those countries with the highest disparities among their regions: the UK; Germany, Italy, but also Greece experience extreme divide between their richest and poorest regions (Figure 61).

Notwithstanding the high income disparities still existing in 2007, there was a clear trend towards convergence in the time period of 2000-2007 across all European regions (Figure 62). The beta convergence shows that regions with low household incomes catched up faster than those with already high income levels, since the income increases of regions with household incomes of less than 10,000 Euros was much higher compared to the other regions (Figure 63).

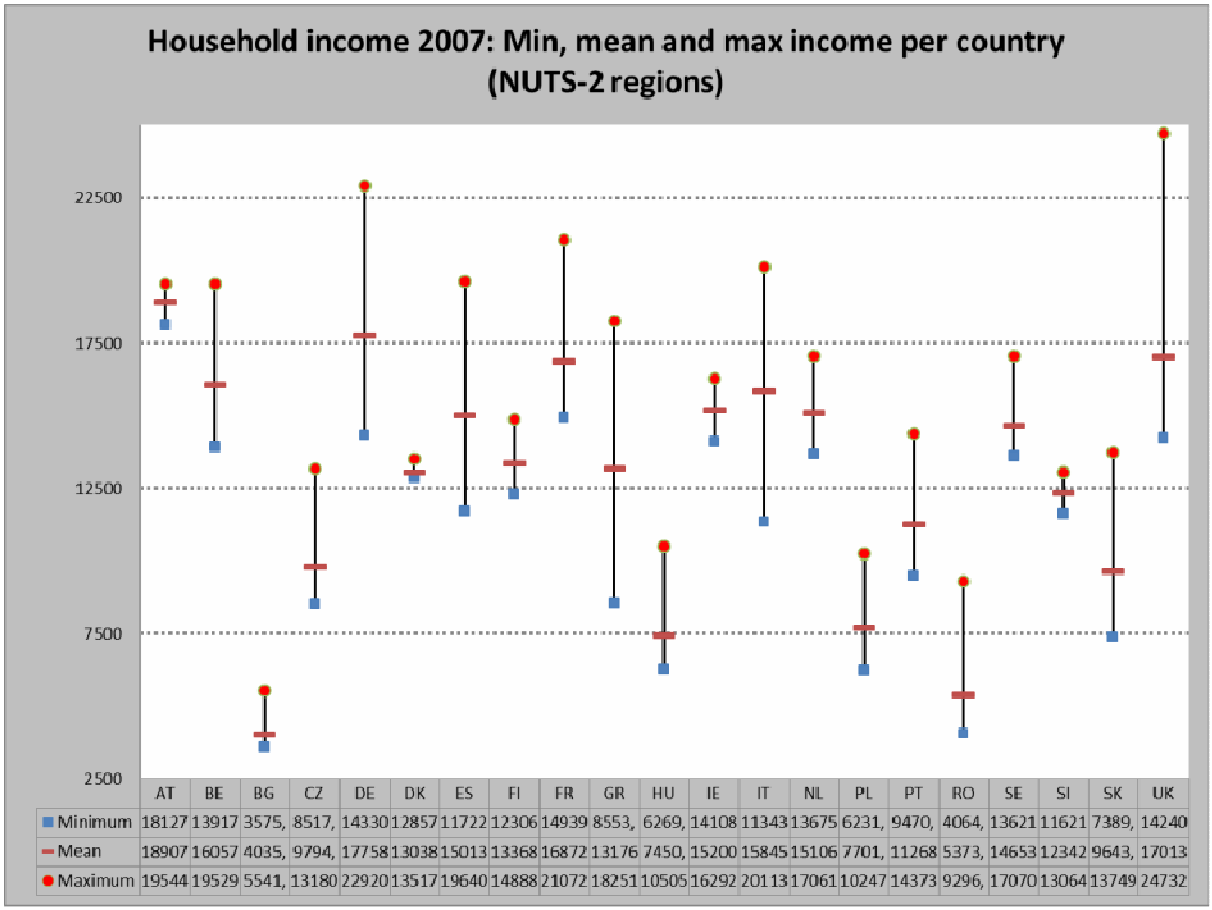


Figure 61. Disposable household income – Minima, maxima and averages

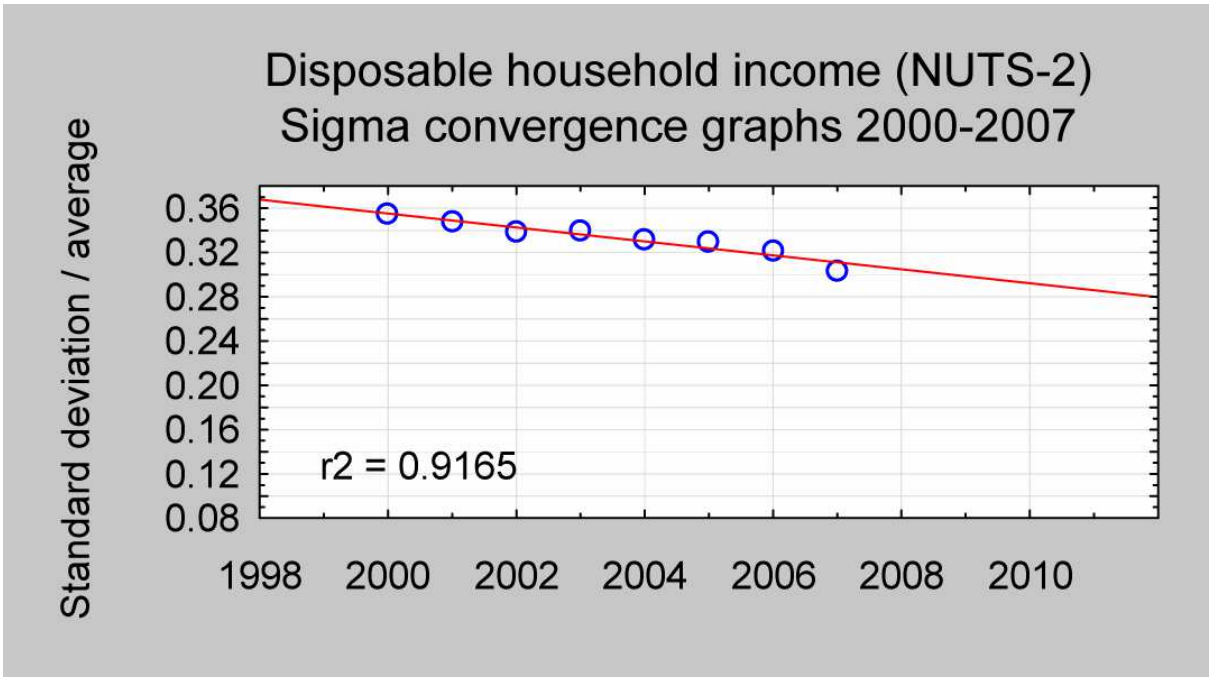


Figure 62. Disposable household income – development of disparities 2000-2007

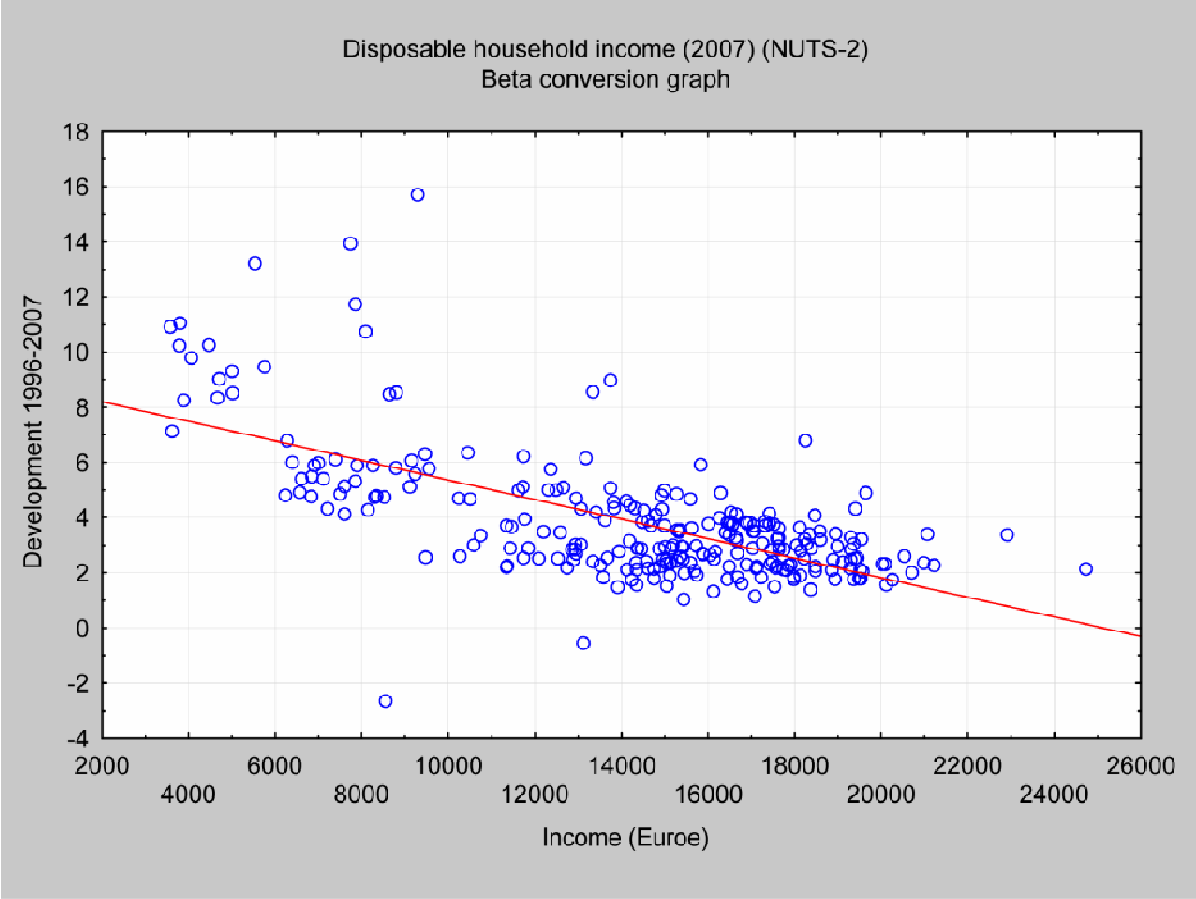
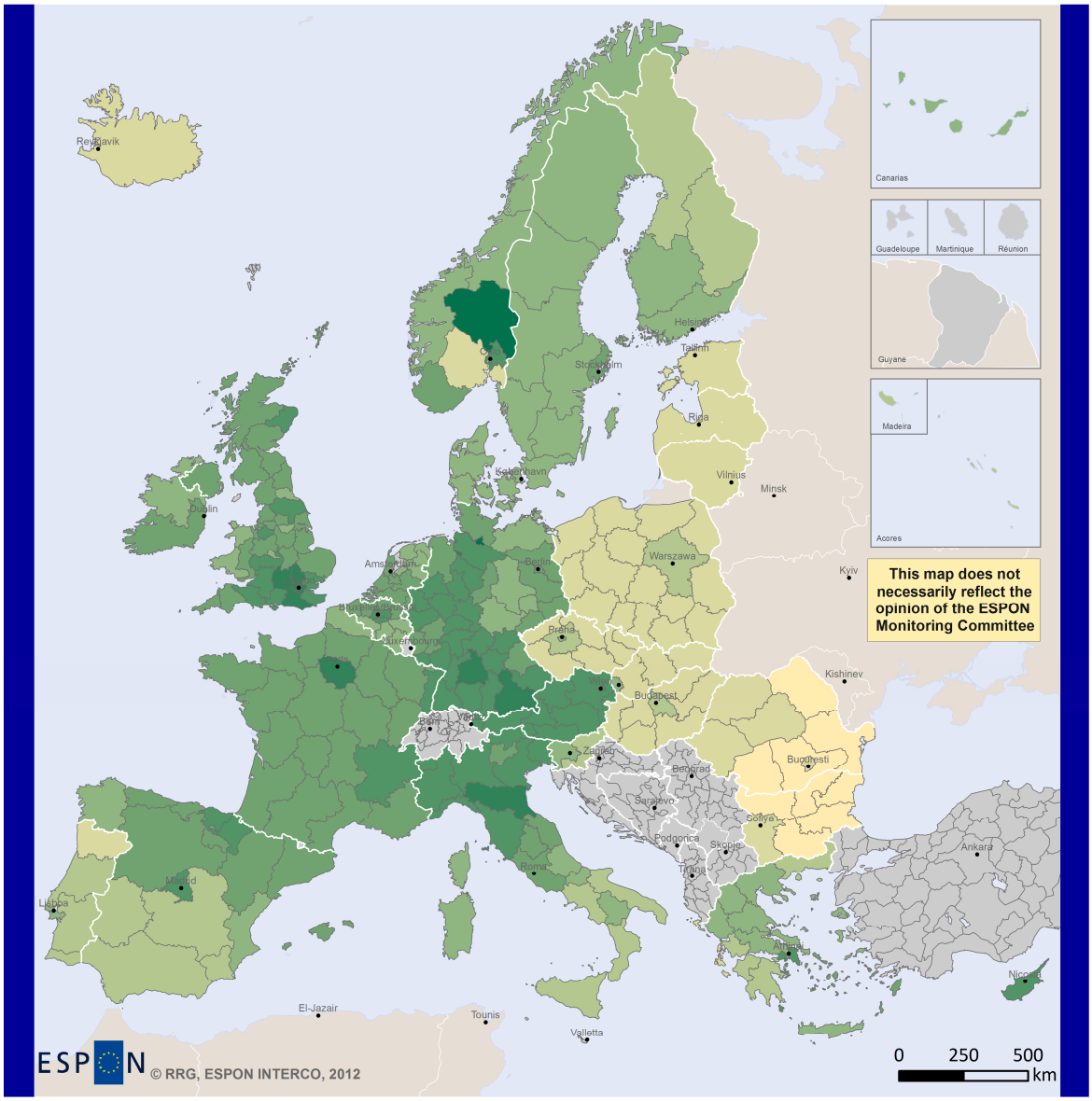


Figure 63. Disposable household income – beta convergence

Disposable household income (2007)

0 7 0 3 d i h o i n c _ 2 0 0 7 n 2 m e t

Territorial objective	*Change direction*	*Gaps*	*Years available*
Inclusion and quality of life	Increase desired with lagging regions catch up faster	Missing data: CH, LI, LU, MT, TR, Western Balkans, French o.d.; data NO 2004	1996-2007



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Iceland: own calculations based on data provided by Statistics Iceland

in EUR

0 - 5,000	15,001 - 17,500	No data
5,001 - 10,000	17,501 - 20,000	
10,001 - 12,500	20,001 - 22,500	
12,501 - 15,000	22,501 - 35,000	

Indicator definition

Total household income minus current household taxes.

Sigma convergence

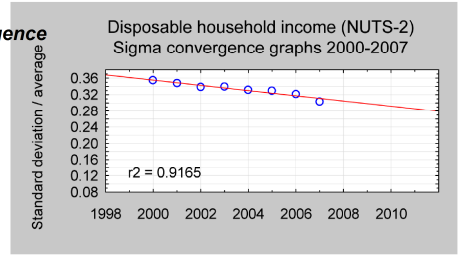


Figure 64. Indicator – disposable household income

Life expectancy at birth

Theme:

0603 SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE. Health

Policy relevance:

This indicator represents a proxy for the overall quality of the health-care system in a region. It tells us about healthiness of living environment and together with ageing index it allows to assess social policies projections and risk of exclusion.

Desired direction of change:

Life expectancy should at least be stable; decreases should be avoided, regions with expectancies of less than 75 years should catch up faster.

Description:

The map basically illustrates three findings (Figure 68): First, the general life expectancy in Europe lies between 72 and 84 years, i.e. within a time span of 12 years. Second, life expectancy is generally higher in EU15 compared to EU27, since all new EU Member States have significantly lower expectancies compared to Western Europe. Third, even in West European countries a distinction between Northern regions (lower expectancy) and southern regions (high expectancy) can be found, for instance in the UK and Germany and, to a lesser degree, in France or Greece.

Even though the general range of values between 72 and 84 years is rather small (Figure 65), the variations between the countries are completely different. There are countries with very small ranges, smaller than two or one years (Austria, Ireland, Netherlands, Norway), but there are also countries with great disparities of four or even more years (Hungary, Portugal, UK); in the latter case obviously it very much depends where people are living.

The disparities of this indicator remained almost stable in the period 2002-2008, although at a low level (Figure 66). As Figure 67 shows, the percentage development of the regions was close to zero, i.e. there was no significant development over time for almost all regions. However, the beta convergence shows that regions with already high life expectancies increased these expectancies overproportionally, even though at a very, almost neglectable level.

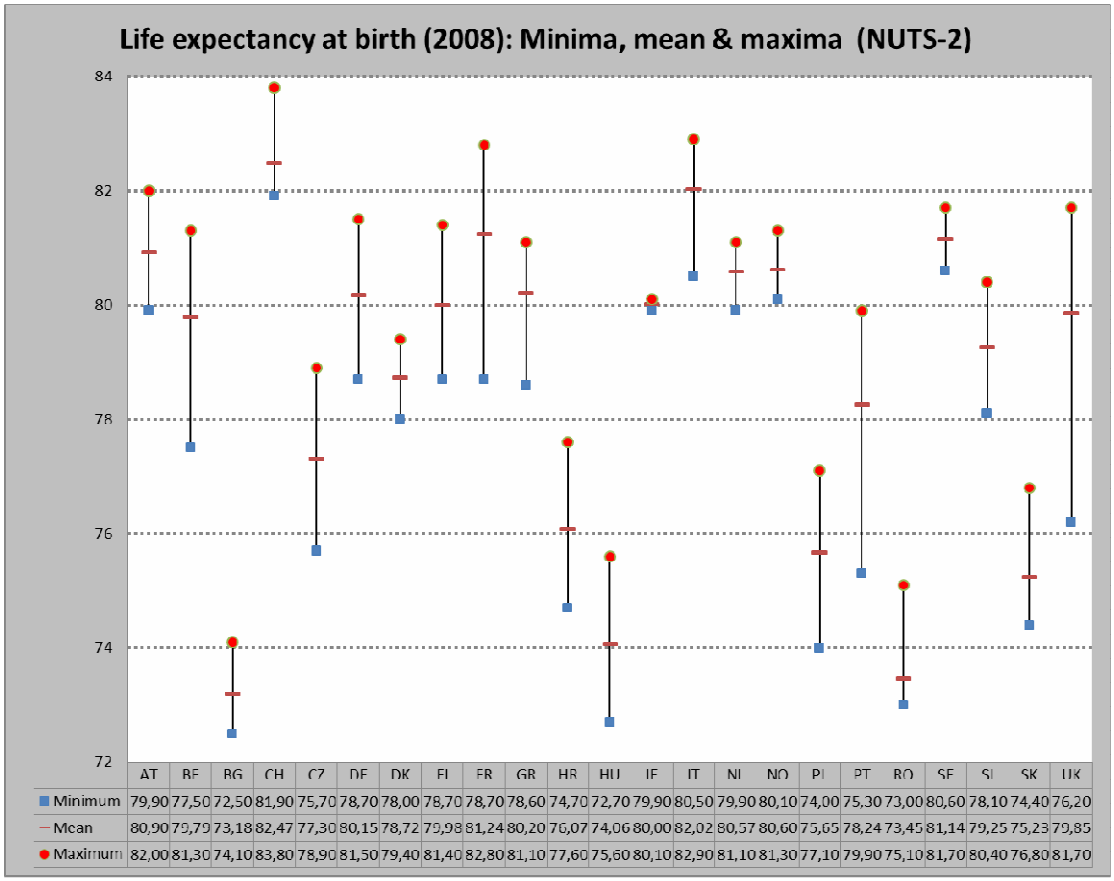


Figure 65. Life expectancy at birth by country – Minima, maxima and averages

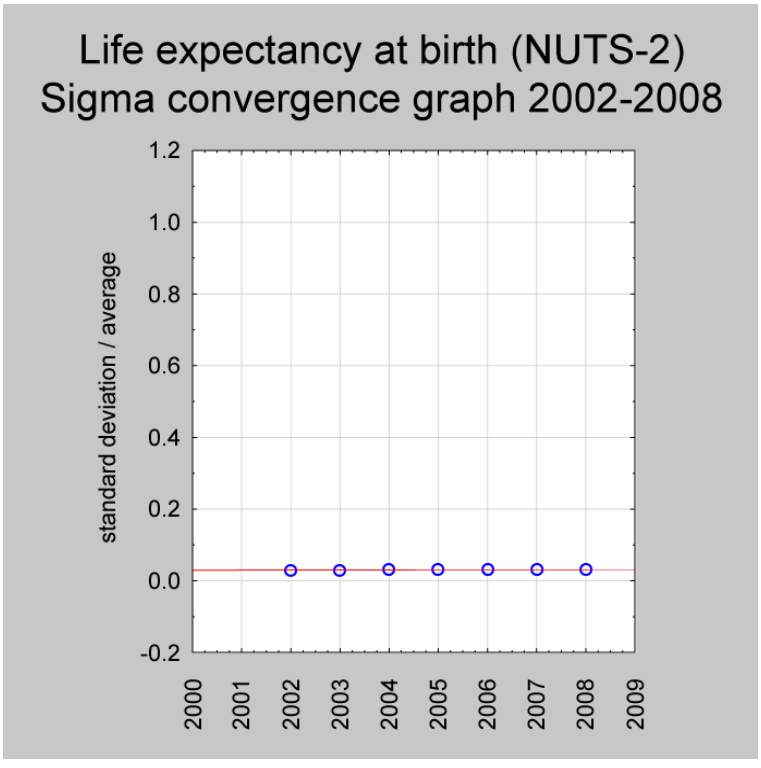


Figure 66. Life expectancy at birth – development of disparities 2002-2008

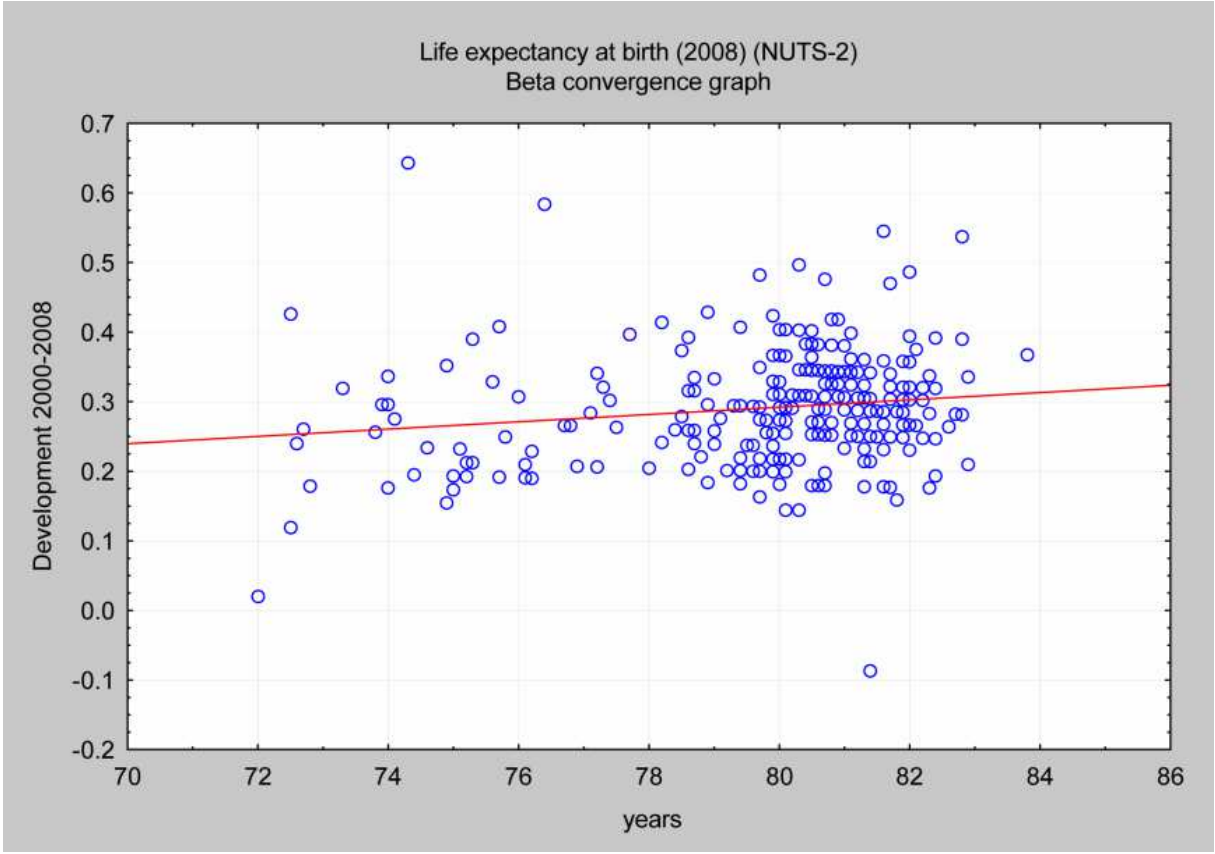
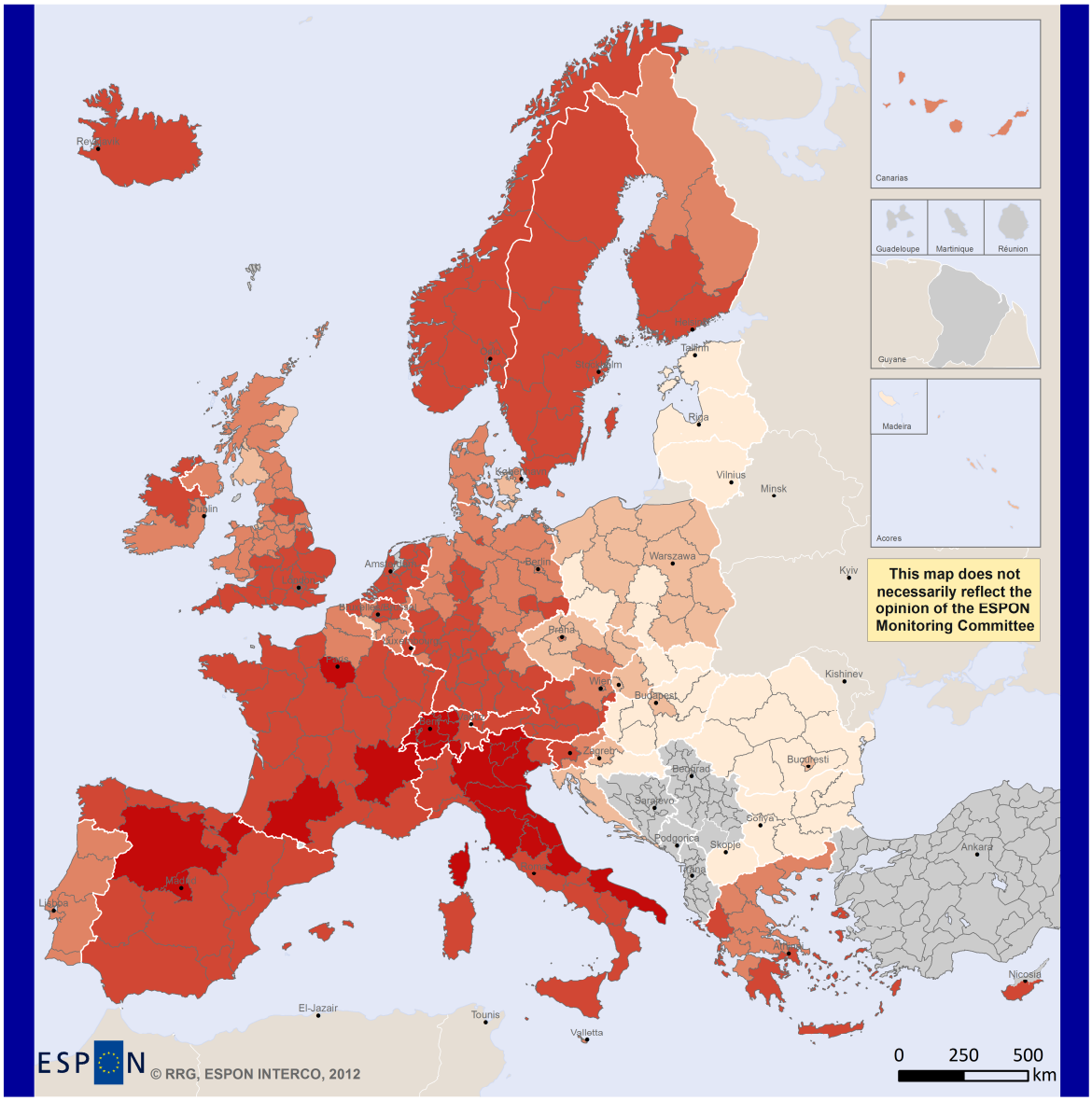


Figure 67. Life expectancy at birth – beta convergence

Life expectancy at birth (2008)

0 6 0 3 I e a b – – – – 2 0 0 8 n 2 m e t

Territorial objective	*Change direction*	*Gaps*	*Years available*
Inclusion and quality of life	Stable expectancy; avoid decrease; lagging regions catch up	Missing data: TR, Western Balkans, French o.d.; Data BE, NO, UK for 2007	2000-2008



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in years

- 72 - 75
- 76 - 78
- 79 - 80
- 81 - 82
- 83 - 84
- No data

Indicator definition

Average expectancy for both women and men

Sigma convergence

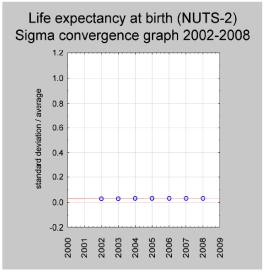
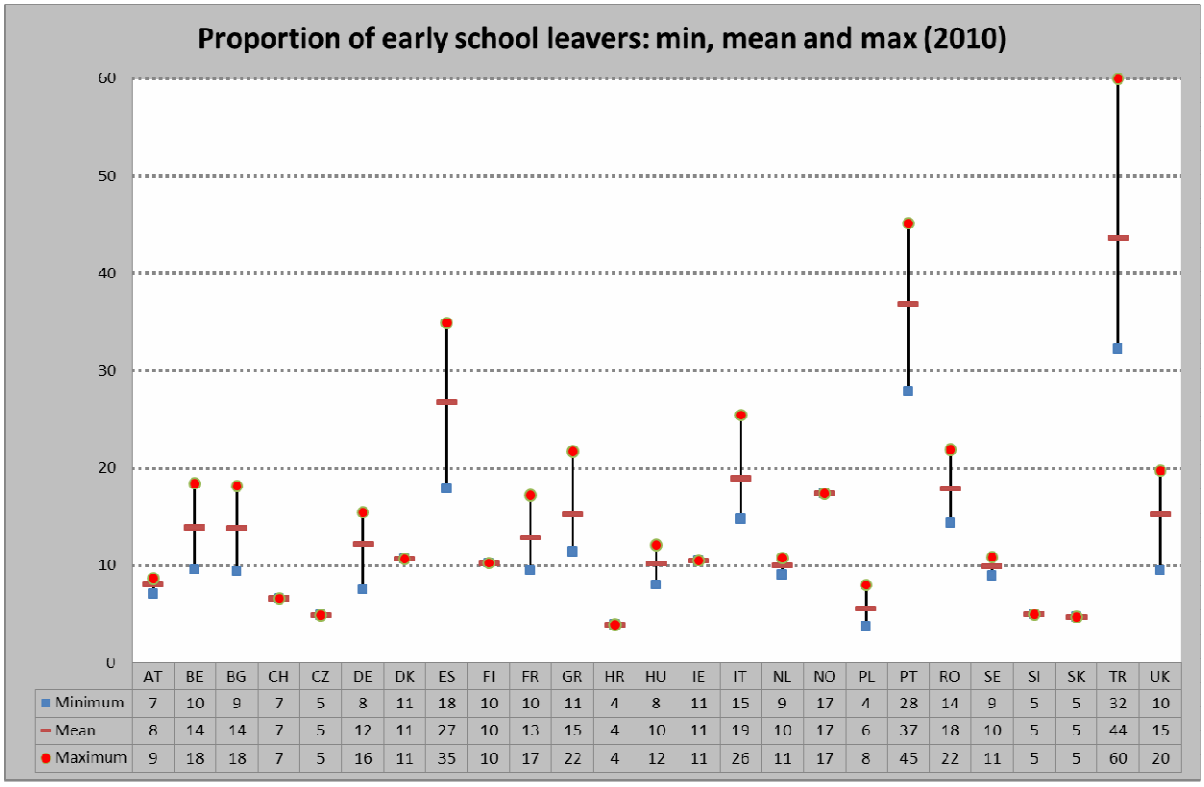


Figure 68. Indicator – Life expectancy at birth

Proportion of early school leavers

Theme: 0602 SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE. Education
Policy relevance: This indicator measures the quality of the school system and potential inclusion in labour market. Low level of education is more likely to expose to low income and eventually to low life expectancy.
Desired direction of change: A decrease to zero is desired, since adequate and highest level of education is needed for Europe as a whole as assets in global markets.
Description: In most regions in Europe, the proportion of early school leavers in 2010 accounts for 11-20 percent; lower proportions can be found in Poland, Czech Republic, Slovenia and Croatia, higher proportions in Turkey, Romania, Spain, Portugal and Southern Italy (Figure 69). With the exception of Portugal, Spain and Turkey, disparities at regional level within countries are rather small; however, there are indeed variations of the general level between the countries (for instance, Swiss or Czech Republic compared to the other countries). Notwithstanding these actual disparities, there has been a trend towards convergence since 2006 across all regions in Europe (Figure 70). This convergence trends was mainly caused by regions with high proportion of early school leavers who managed to reduce this proportion significantly (Figure 71). Regions with rather low proportion behaved differently: partly they managed to reduce this proportion even more since 2006, but for some of them the proportion increased.



	AT	BE	BG	CH	CZ	DE	DK	ES	FI	FR	GR	HR	HU	IE	IT	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
Minimum	7	10	9	7	5	8	11	18	10	10	11	4	8	11	15	9	17	4	28	14	9	5	5	32	10
Mean	8	14	14	7	5	12	11	27	10	13	15	4	10	11	19	10	17	6	37	18	10	5	5	44	15
Maximum	9	18	18	7	5	16	11	35	10	17	22	4	12	11	26	11	17	8	45	22	11	5	5	60	20

Figure 69. Early school leavers by country – minima, maxima and averages

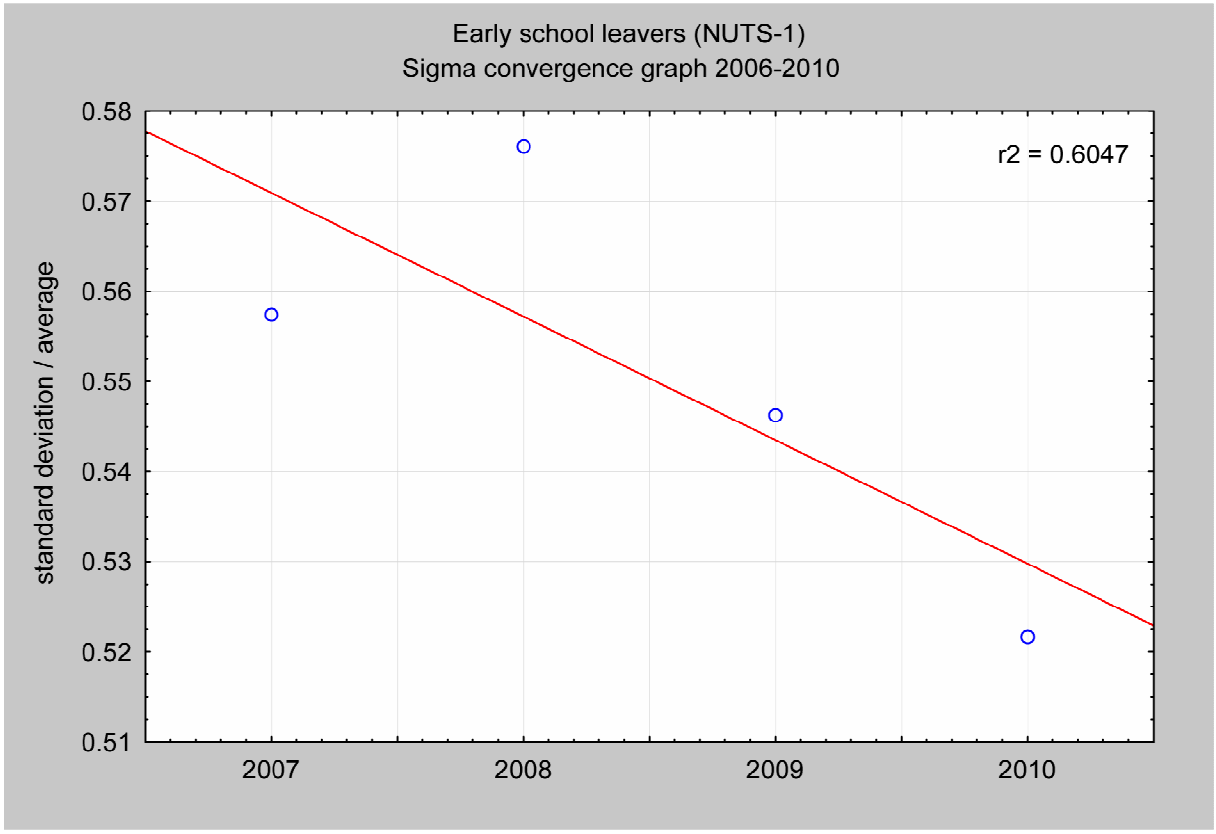


Figure 70. Early school leavers – development of disparities 2006-2010

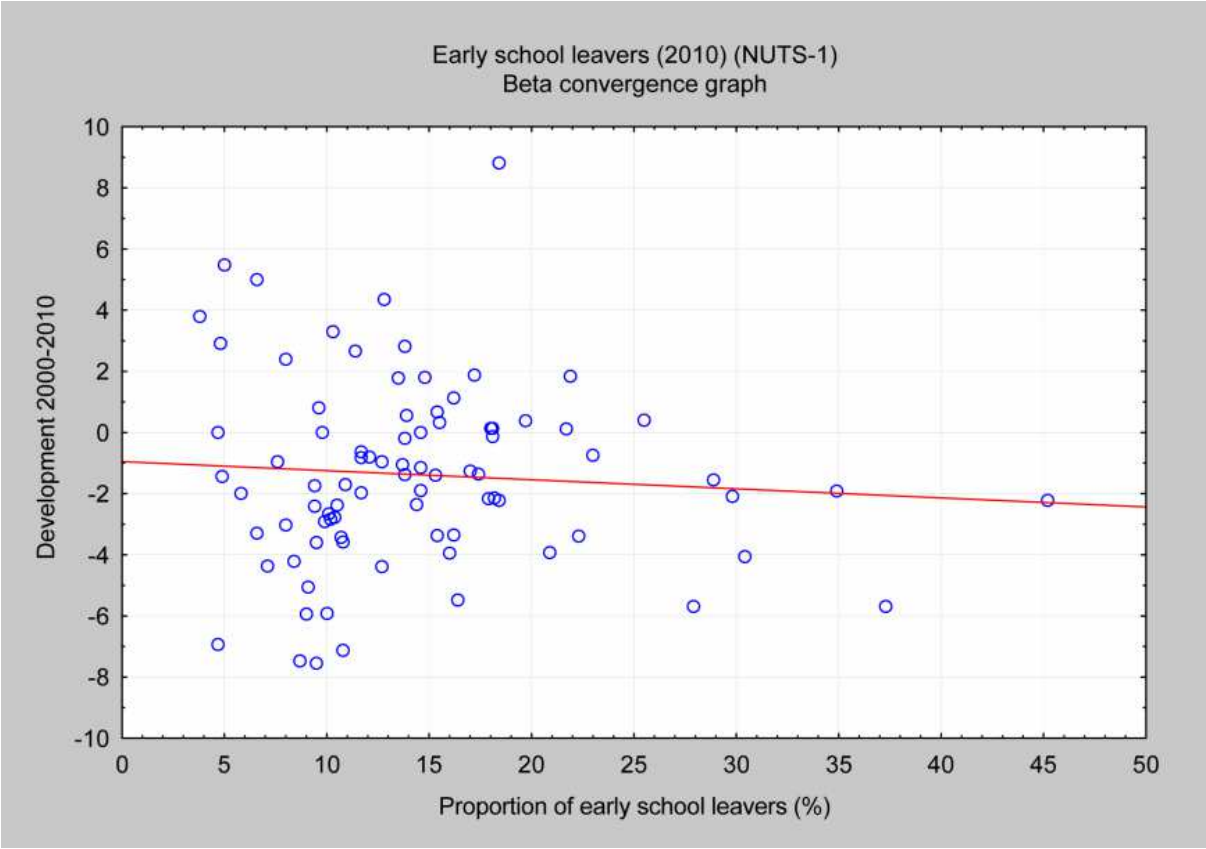
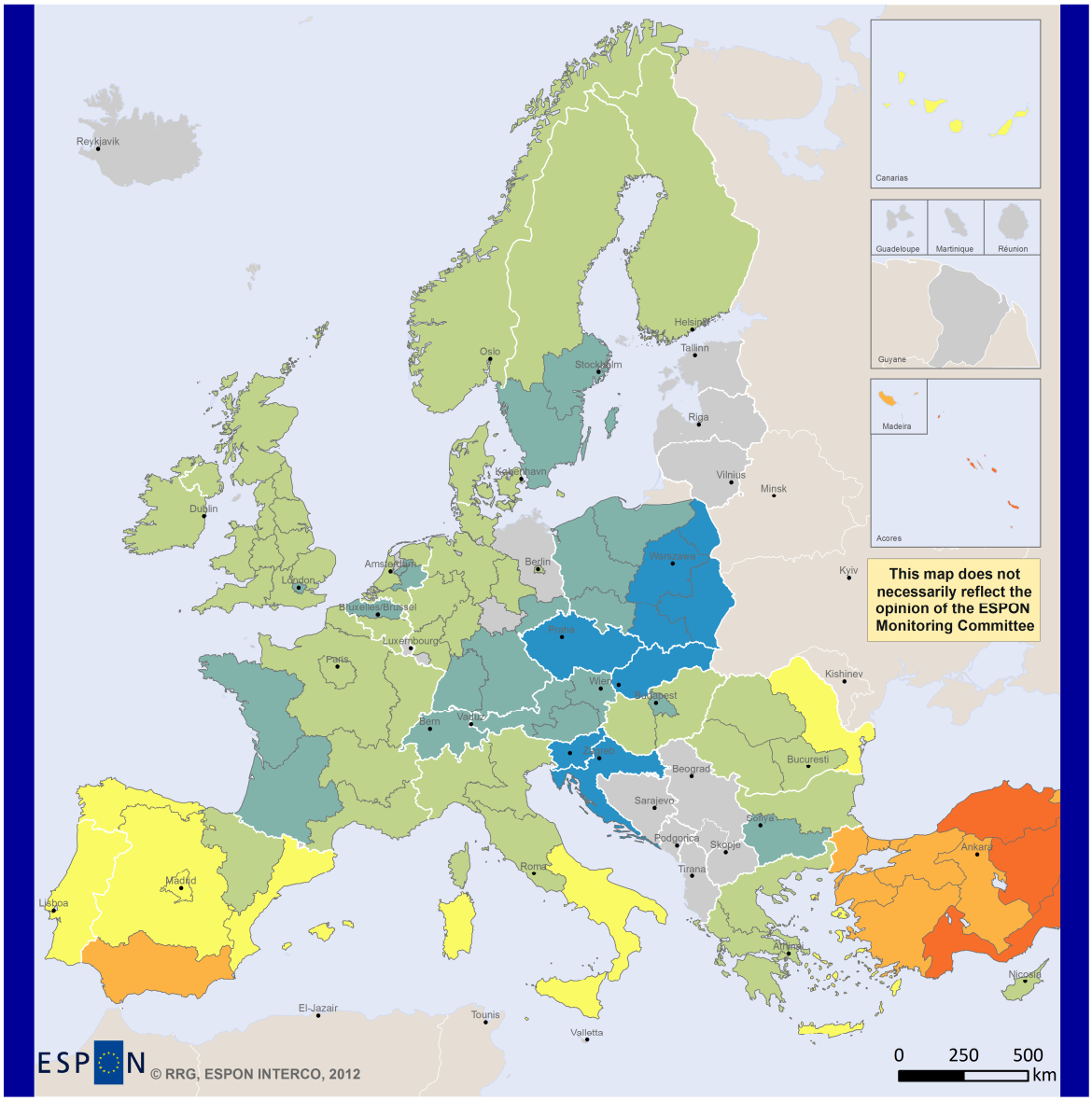


Figure 71. Early school leavers – beta convergence

Proportion of early school leavers (2010)

0 6 0 2 e a r s l e a _ 2 0 1 0 n 1 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Inclusion and quality of life	Reduction to zero desired.	Missing data: IS, LI, Baltic States, FOD, Eastern Germany, Western Balkans	2000-2010



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in %

- 4 - 5
- 6 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- No data

Indicator definition

Early leavers from education and training

Sigma convergence

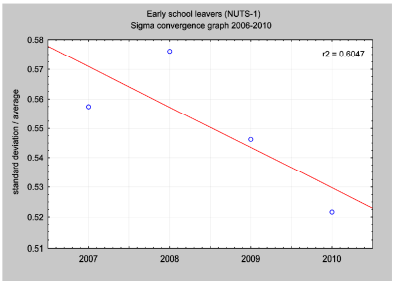


Figure 72. Indicator – early school leavers.

Gender imbalances

Theme:

0201 DEMOGRAPHY. Population structure

Policy relevance:

This indicator measures differences in the gender composition of a society. A balanced participation of men and women in activities is one determinant for an inclusive society.

Desired direction of change:

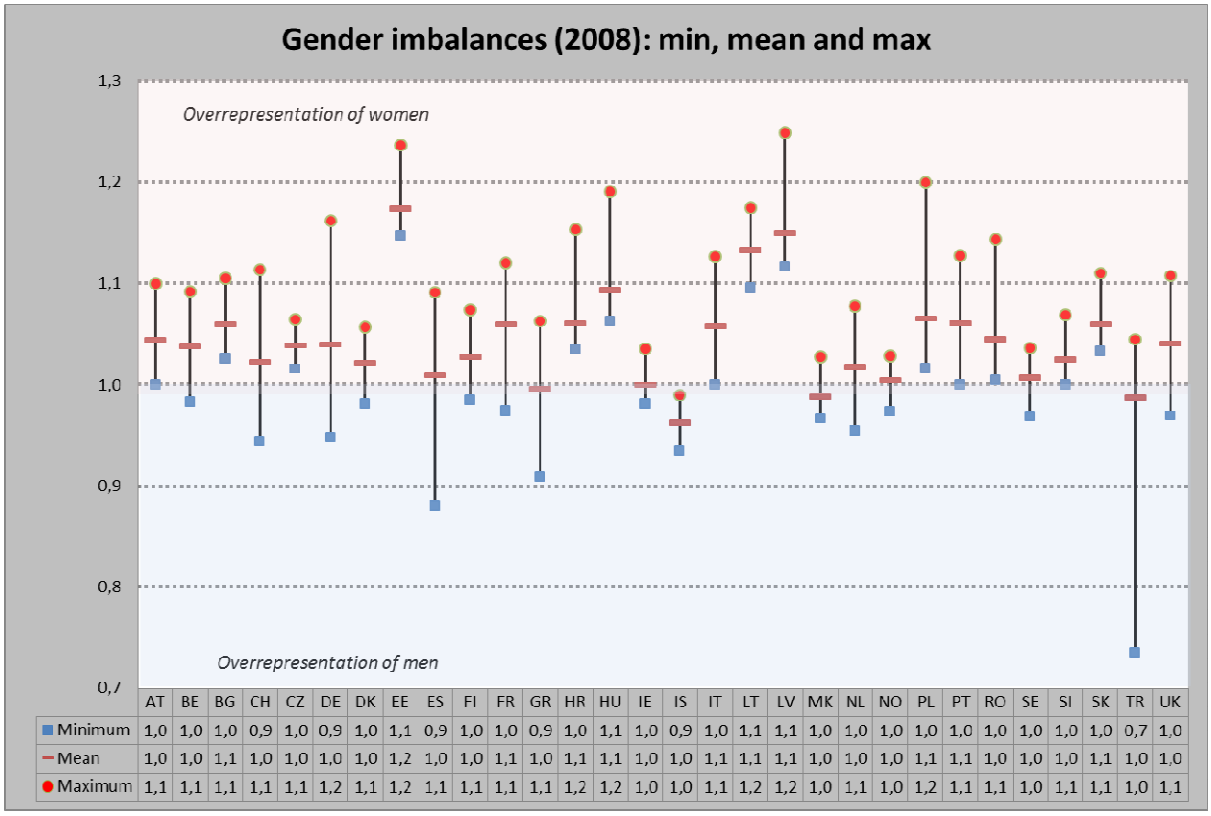
A balanced demographic structure between female and male population should be aspired.

Description:

The majority of regions in Europe experience a slight overrepresentation of women (Figure 73); only the Baltic States, as well as selected regions in Poland, Hungary, Southern France and Portugal have higher overrepresentations of women. In turn, regions in Northern Scandinavia, Ireland, East Germany, large parts of Spain, Greece and Turkey see a overrepresentation of men.

An almost balanced gender structure for the overall country can be observed for smaller countries like Cyprus, Ireland, Luxembourg, Macedonia, Malta or Norway.

This indicator experienced almost no development since 2003, neither for measuring across all regions, nor by differentiating the type of region. The sigma convergence remained stable, however, at a low level (Figure 74). As the beta convergence shows (Figure 75), the development since 2000 was for most regions in the range of +/- 0.5 percentage points only.



	AT	BE	BG	CH	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU	IE	IS	IT	LT	LV	MK	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
Minimum	1,0	1,0	1,0	0,9	1,0	0,9	1,0	1,1	0,9	1,0	1,0	0,9	1,0	1,1	1,0	0,9	1,0	1,1	1,1	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	0,7	1,0
Mean	1,0	1,0	1,1	1,0	1,0	1,0	1,0	1,2	1,0	1,0	1,1	1,0	1,1	1,1	1,0	1,0	1,1	1,1	1,1	1,0	1,0	1,0	1,1	1,1	1,0	1,0	1,0	1,1	1,0	1,0
Maximum	1,1	1,1	1,1	1,1	1,1	1,2	1,1	1,2	1,1	1,1	1,1	1,1	1,2	1,2	1,0	1,0	1,1	1,2	1,2	1,0	1,1	1,0	1,2	1,1	1,1	1,0	1,1	1,1	1,0	1,1

Figure 73. Gender imbalances by country – minima, maxima and averages

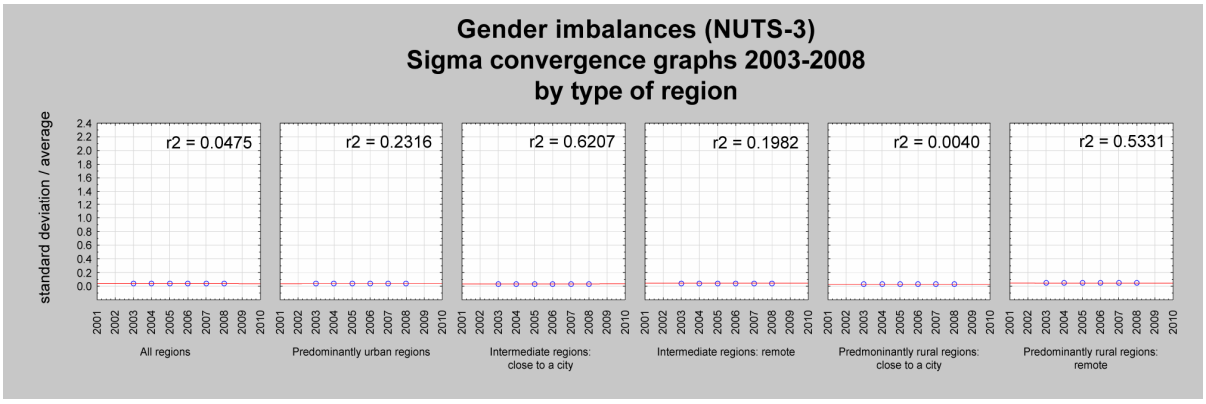


Figure 74. Gender imbalances – development of disparities 2003-2008

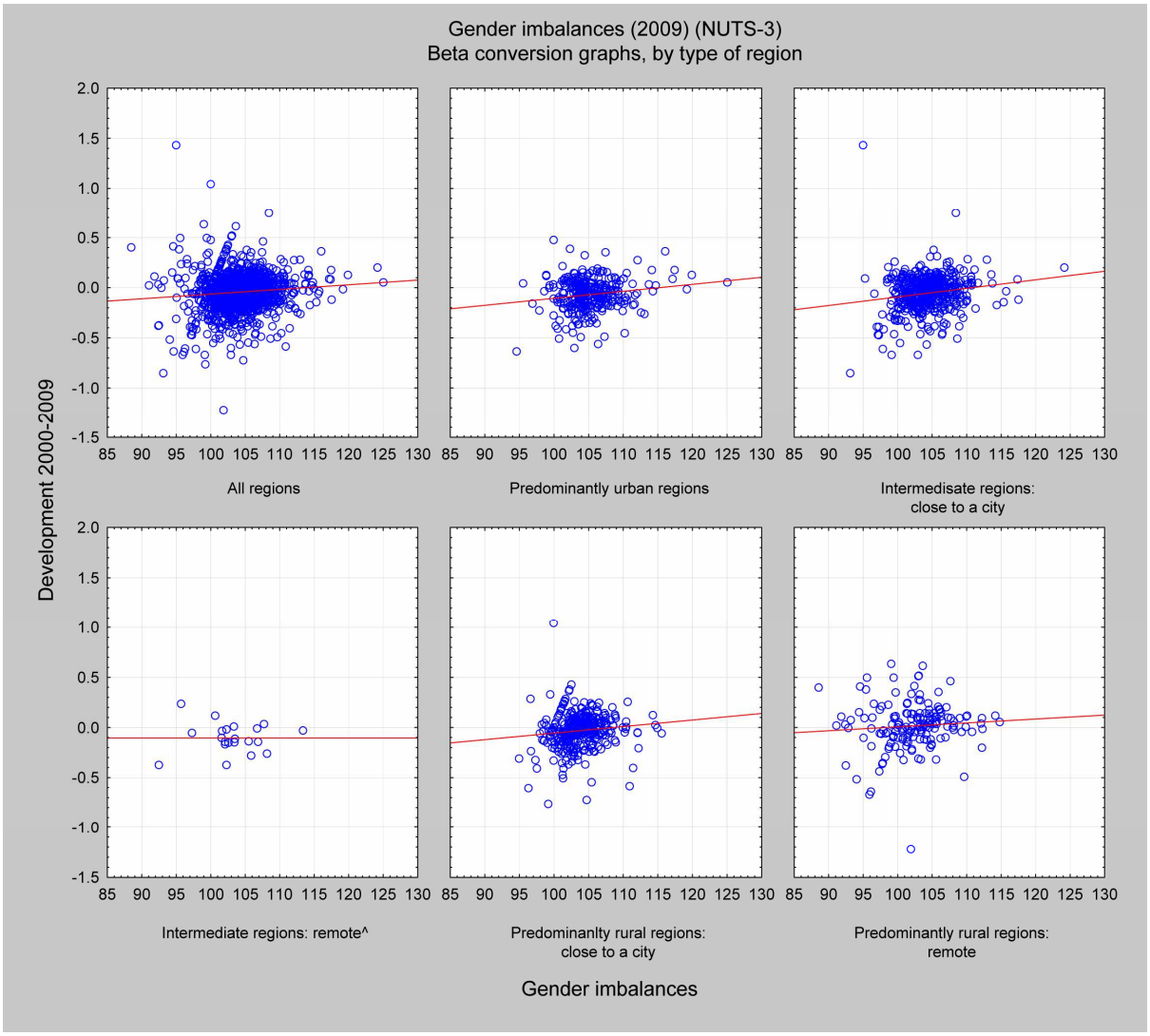
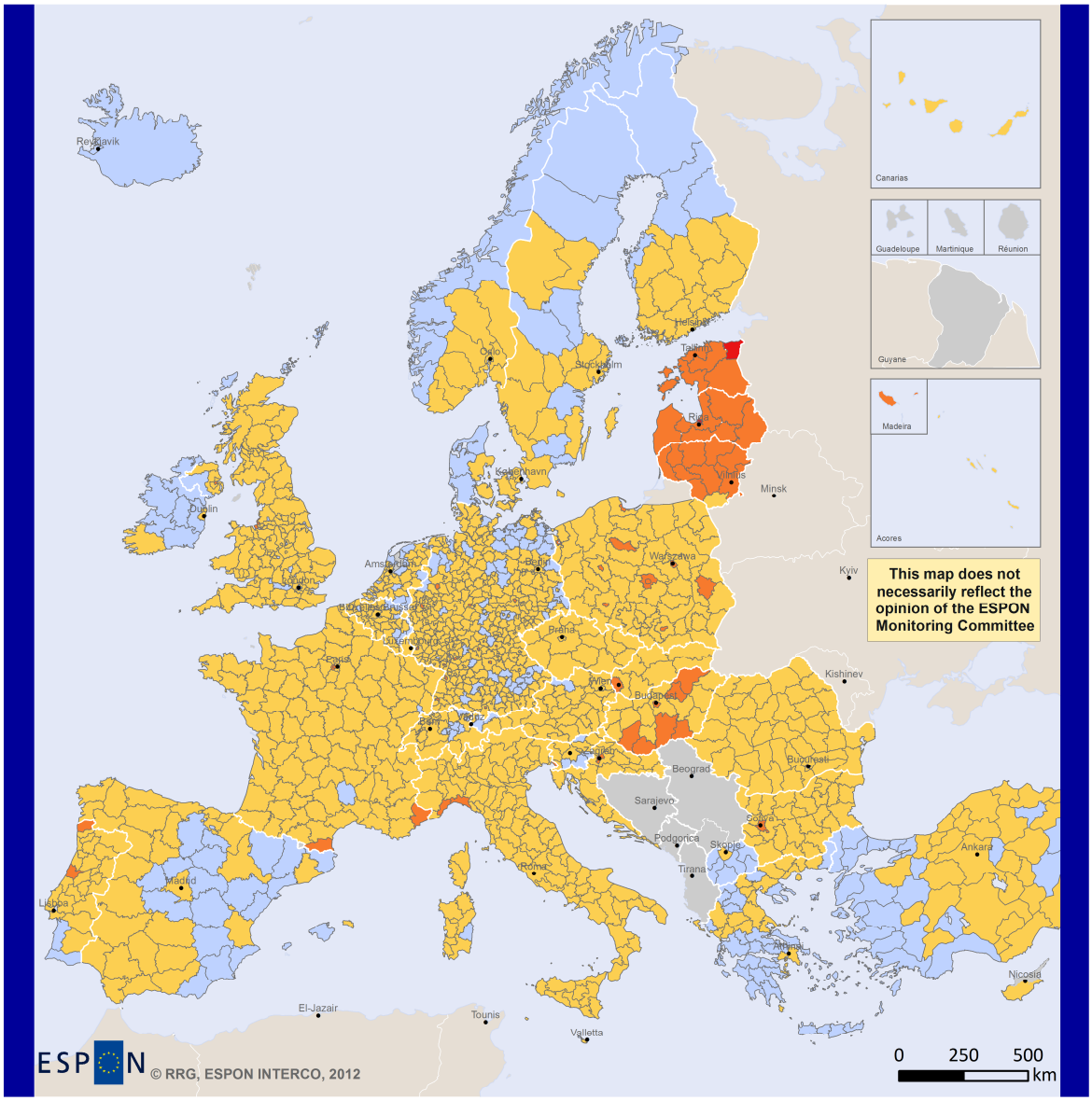


Figure 75. Gender imbalances – beta convergence.

Gender imbalances (2008)

0 2 0 1 g e n d i m b _ 2 0 0 8 n 3 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Inclusion and quality of life	Maintain balanced demographic structure	Missing data: AL, BA, LI, RS, KS, French overseas departments	2000-2009



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Regional level: NUTS 3
Data source: Eurostat, Regio database, 2011
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Women

underrepresentation		*overrepresentation*		
0.7 - 0.8		1.0 - 1.1		No data
0.8 - 0.9		1.1 - 1.2		
0.9 - 1.0		1.2 - 1.3		

Indicator definition

Ratio female/male population

Sigma convergence

Gender imbalances (NUTS-3)
Sigma convergence graphs 2003-2008

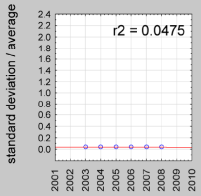
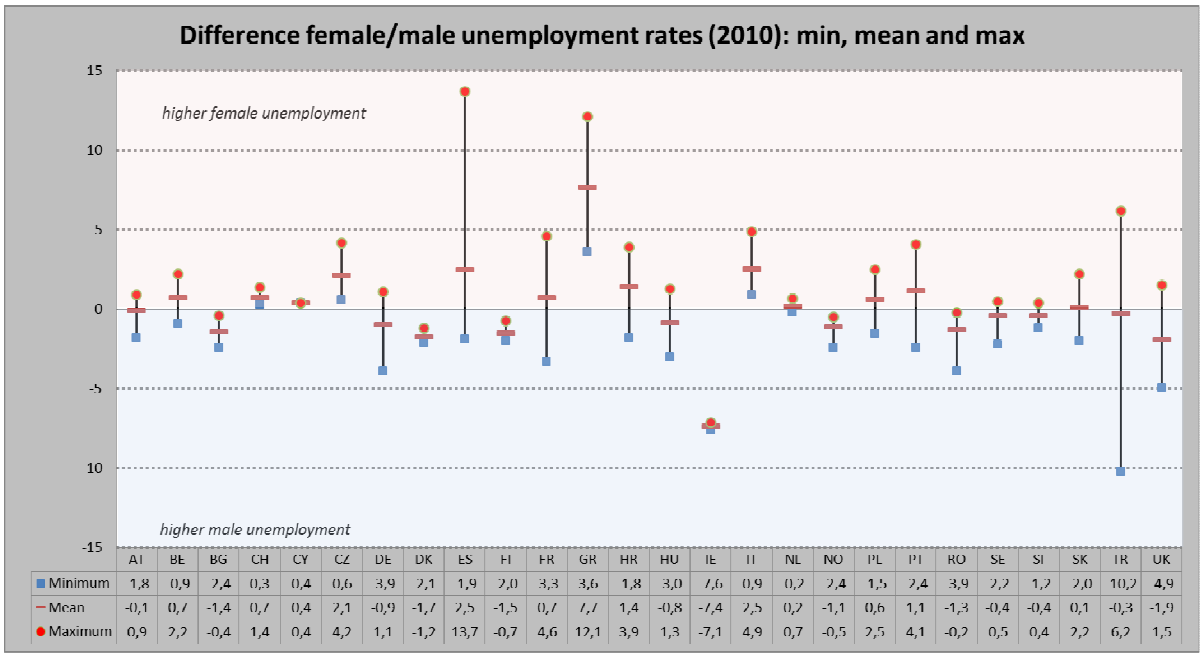


Figure 76. Indicator – Gender imbalances

Differences in female-male unemployment rates

Theme: 0702 ECONOMY, LABOUR FORCE. Employment, Unemployment
Policy relevance: This indicator measures the female participation rate in the economy, and thus the overall quality of labour markets of an inclusive society.
Desired direction of change: The difference between the female and male unemployment rates should decreased, i.e. there should be no significant difference in unemployment for women or men. Furthermore, a general decrease in unemployment rates should be aspired.
Description: The spatial patterns reveal interesting pictures (Figure 78): while in Scandinavia, the Baltic States, Germany, UK, Ireland, Bulgaria and Romania higher unemployment rates for men can be observed, the opposite is true for the Mediterranean countries, France, Poland, Czech Republic and Slovakia, where higher female unemployment rates can be detected. There are only few countries with balanced unemployment rates across sex (Figure 77), which are Switzerland, Denmark, Finland, Netherlands, Norway and Slovenia. For the other countries great disparities exist, with the highest ones in Spain, France, Greece and Turkey. Disparities are decreasing between 2004 and 2008.



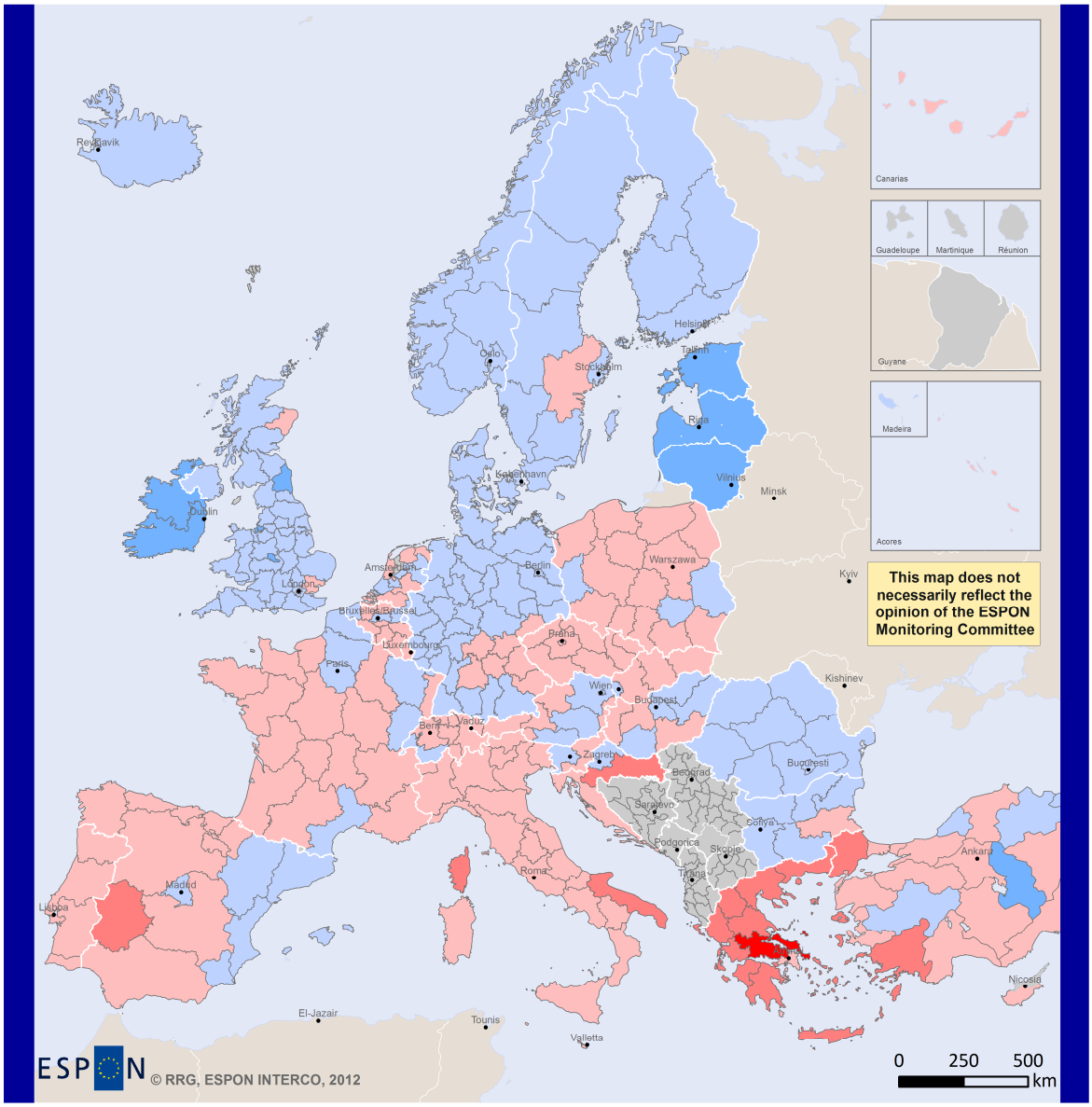
	AT	BE	BG	CH	CY	CZ	DE	DK	ES	FI	FR	GR	HR	HU	IE	IT	NL	NO	PL	PT	RO	SE	SI	SK	TR	UK
Minimum	1,8	0,9	2,4	0,3	0,4	0,6	3,9	2,1	1,9	2,0	3,3	3,6	1,8	3,0	7,6	0,9	0,2	2,4	1,5	2,4	3,9	2,2	1,2	2,0	10,2	4,9
Mean	-0,1	0,7	-1,4	0,7	0,4	2,1	-0,9	-1,7	2,5	-1,5	0,7	7,7	1,4	-0,8	-7,4	2,5	0,2	-1,1	0,6	1,1	-1,3	-0,4	-0,4	0,1	-0,3	-1,9
Maximum	0,9	2,2	-0,4	1,4	0,4	4,2	1,1	-1,2	13,7	-0,7	4,6	12,1	3,9	1,3	-7,1	4,9	0,7	-0,5	2,5	4,1	-0,2	0,5	0,4	2,2	6,2	1,5

Figure 77. Female/male unemployment by country – minima, maxima and averages

Difference in female/male unemployment rates (2010)

0 7 0 2 u n e m d i f f 2 0 1 0 n 2 m e t

Territorial objective	*Change direction*	*Gaps*	*Years available*
Inclusion and quality of life	Differences to be minimised; overall rate to decrease to zero	Missing data: LI, Western Balkans, FOD Data BE, NO, UK for 2007	1999-2010



Higher unemployment rates for men

- -15 - -10
- -9 - -5
- -4 - 0

Higher unemployment rates for women

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20

No data

Indicator definition

Female unemployment rate - male unemployment rate

Sigma convergence

Figure 78. Indicator – Female/male unemployment rate

Ageing index

Theme:

0201 DEMOGRAPHY. Population structure

Policy relevance:

This indicator measures the balance of the age structure of the society. Unbalanced age structures may lead to overaging of society and to further difficulties in maintaining adequate levels of public services and infrastructure, endangering quality of life.

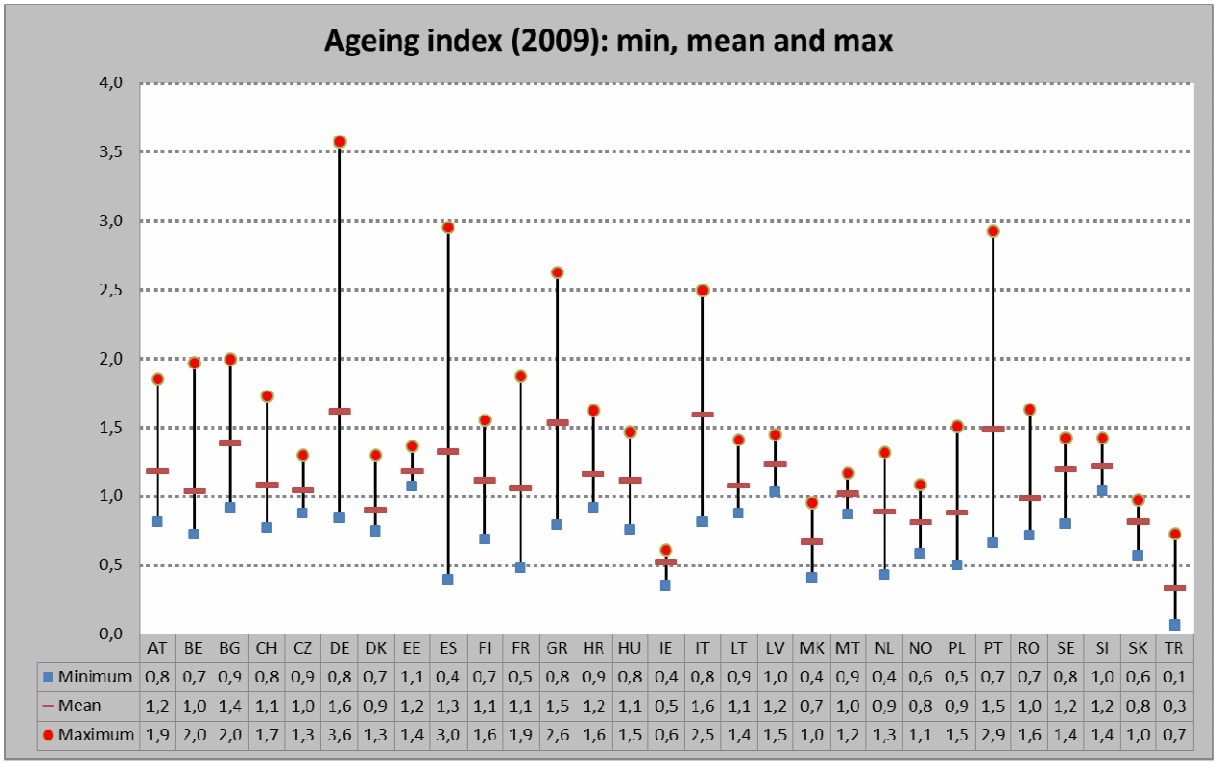
Desired direction of change:

To maintain a balanced age structure of the society and to avoid overaging.

Description:

Figure 80 clearly differentiates regions with a surplus of children (green colors) from those with a surplus of elderly people (purple colors). Societies like Denmark, Iceland, Ireland, Norway, Poland, Romania or Turkey have higher shares of children compared to elderly people. The opposite situation is true in particular for areas in Northwest Spain, in Italy, Greece, Bulgaria, and in East Germany, with overaging societies.

Due to the specific situation in East Germany, Germany is at the same time the country with the highest disparities between NUTS 3 regions, followed by Spain, Portugal and Greece and Italy (Figure 79). The remaining countries have only small disparities.



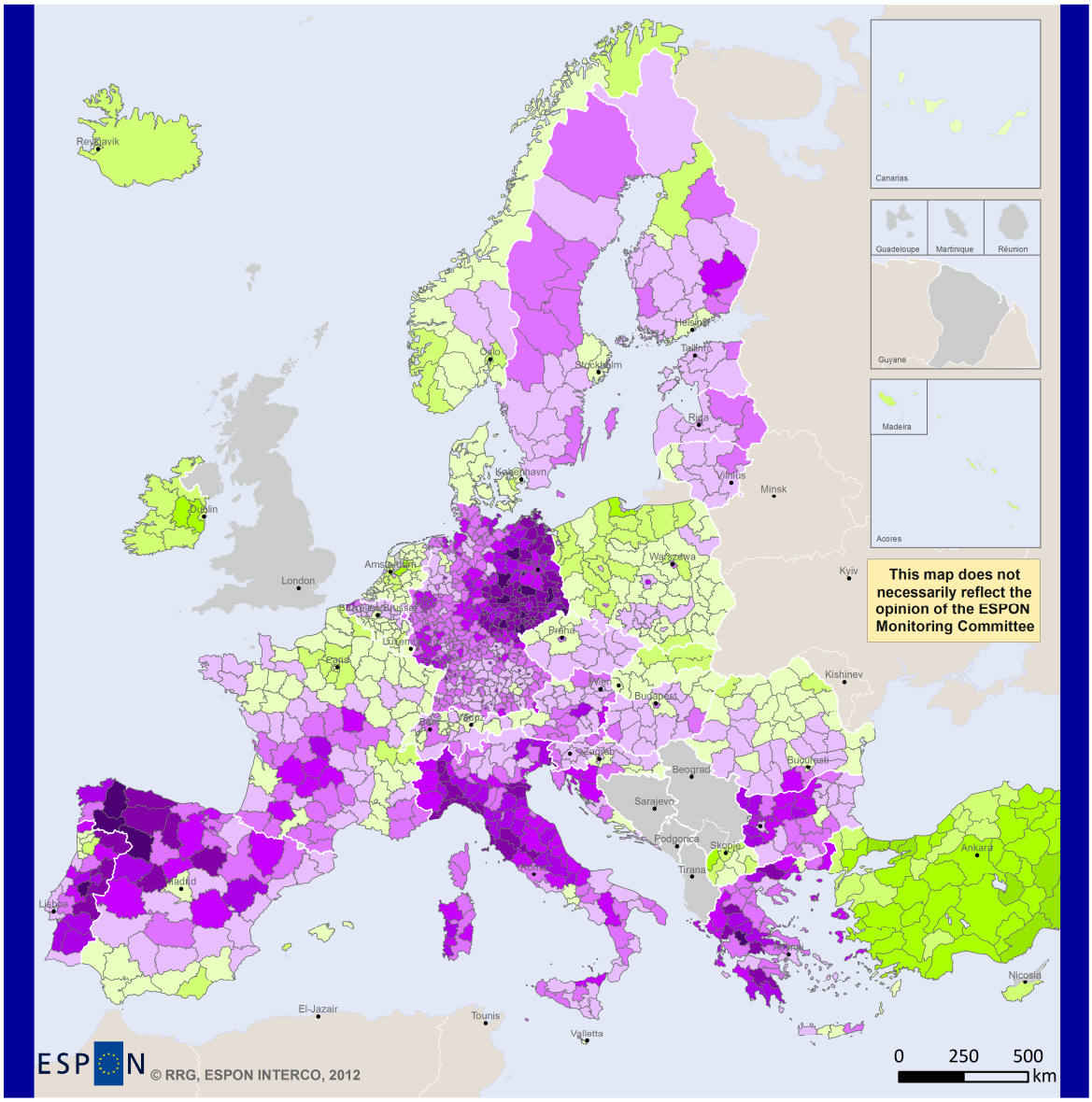
	AT	BE	BG	CH	CZ	DE	DK	EE	ES	FI	FR	GR	HR	HU	IE	IT	LT	LV	MK	MT	NL	NO	PL	PT	RO	SE	SI	SK	TR
Minimum	0,8	0,7	0,9	0,8	0,9	0,8	0,7	1,1	0,4	0,7	0,5	0,8	0,9	0,8	0,4	0,8	0,9	1,0	0,4	0,9	0,4	0,6	0,5	0,7	0,7	0,8	1,0	0,6	0,1
Mean	1,2	1,0	1,4	1,1	1,0	1,6	0,9	1,2	1,3	1,1	1,1	1,5	1,2	1,1	0,5	1,6	1,1	1,2	0,7	1,0	0,9	0,8	0,9	1,5	1,0	1,2	1,2	0,8	0,3
Maximum	1,9	2,0	2,0	1,7	1,3	3,6	1,3	1,4	3,0	1,6	1,9	2,6	1,6	1,5	0,6	2,5	1,4	1,5	1,0	1,2	1,3	1,1	1,5	2,9	1,6	1,4	1,4	1,0	0,7

Figure 79. Ageing index by country – minima, maxima and averages.

Ageing index (2009)

0 2 0 1 a g e i n d _ l _ 2 0 0 9 n 3 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Inclusion and quality of life	Maintain balanced demographic structure, avoid overaging	Missing data: AL, BA, LI, KS, RS, UK, French overseas departments	2000-2010



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Regional level: NUTS 3
Data source: Eurostat, 2011, own calculation
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Elderly people

underrepresentation	*overrepresentation*	
0,06 - 0,25	1,01 - 1,25	No data
0,26 - 0,50	1,26 - 1,50	
0,51 - 0,75	1,51 - 1,75	
0,76 - 1,00	1,76 - 2,00	
	2,01 - 2,50	
	2,51 - 4,00	

Indicator definition

Ratio population above 64 years/population below 15 years

Sigma convergence

Figure 80. Indicator – Ageing index.

Summary

What are the territorial disparities of the indicators selected for the territorial objective of inclusion and quality of life? And how have these indicators developed over the last decade?

Disparities for the indicator ***life expectancy at birth*** remained almost stable, though at a low level. There has been almost no indicator development since 2002. So, differences within countries remain small, but differences between countries are quite high.

Though in 2010 some of the EU Member States still faced high rates of ***early school leavers***, a trend towards convergence could be observed since 2006 for the entire ESPON space. Many regions with high proportions of school leavers managed to reduce these rates significantly. But there were also some regions experiencing increases in the proportion of early school leavers.

There has been almost no indicator development for the ***gender imbalances*** since 2003. Gender imbalances remained stable, though generally at a low level.

Within the countries, we can observe small differences for the ***unemployment rates for women and men***, except for countries like Spain, France, Greece and Turkey. There are only few countries with balanced unemployment rates across sex. Generally, between 2004 and 2008, we can notice a decrease of disparities.

While many countries reveal only small disparities in the ***ageing index***, there are remarkable exceptions like Germany, Spain, Portugal, Greece or Italy which show great disparities between their regions for this indicator.

Despite all the existing disparities in detail as described above, Figure 81 and Figure 82 summaries that altogether disparities between European regions are rather low, and that disparities in the proportion of early school leavers decreased since 2006, furthermore resulting in a trend towards cohesion.

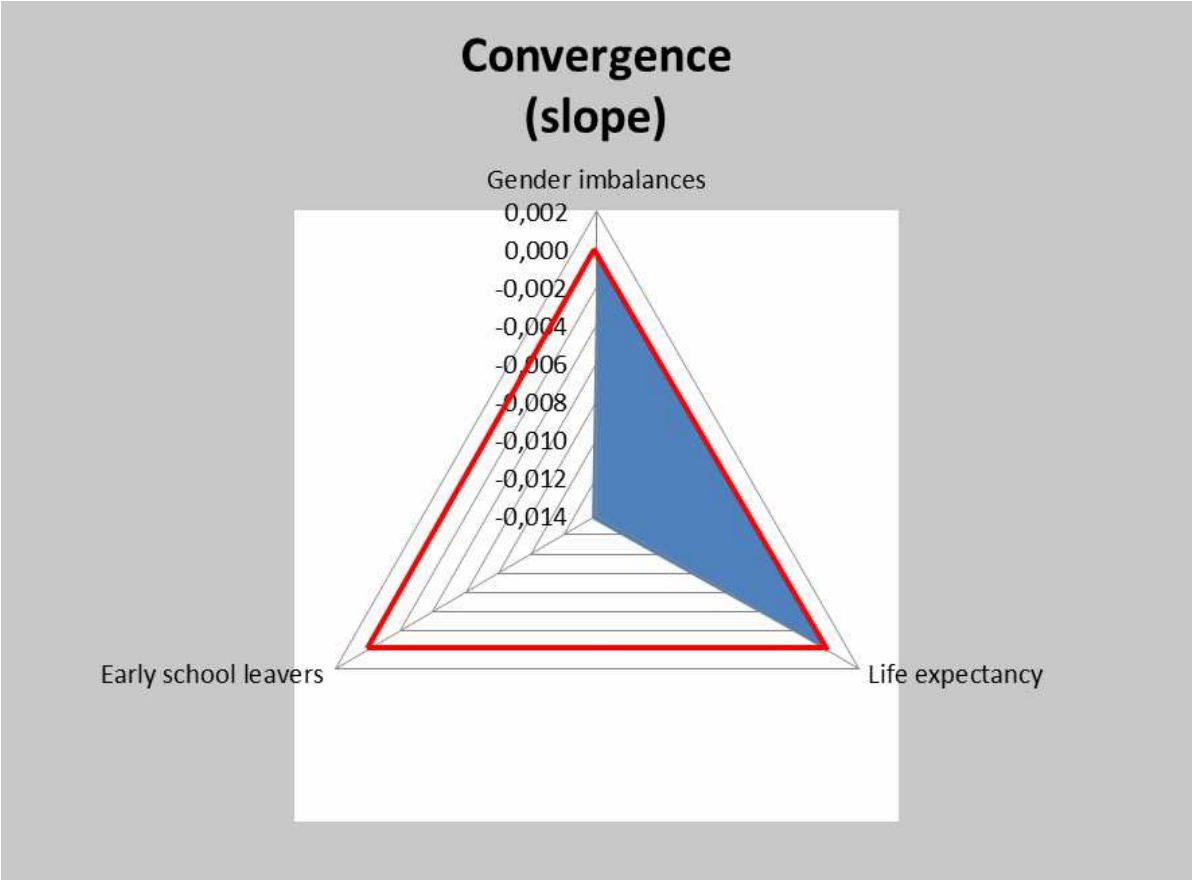


Figure 81. Degree of convergence for indicators under Territorial Objective "Inclusion and quality of life"

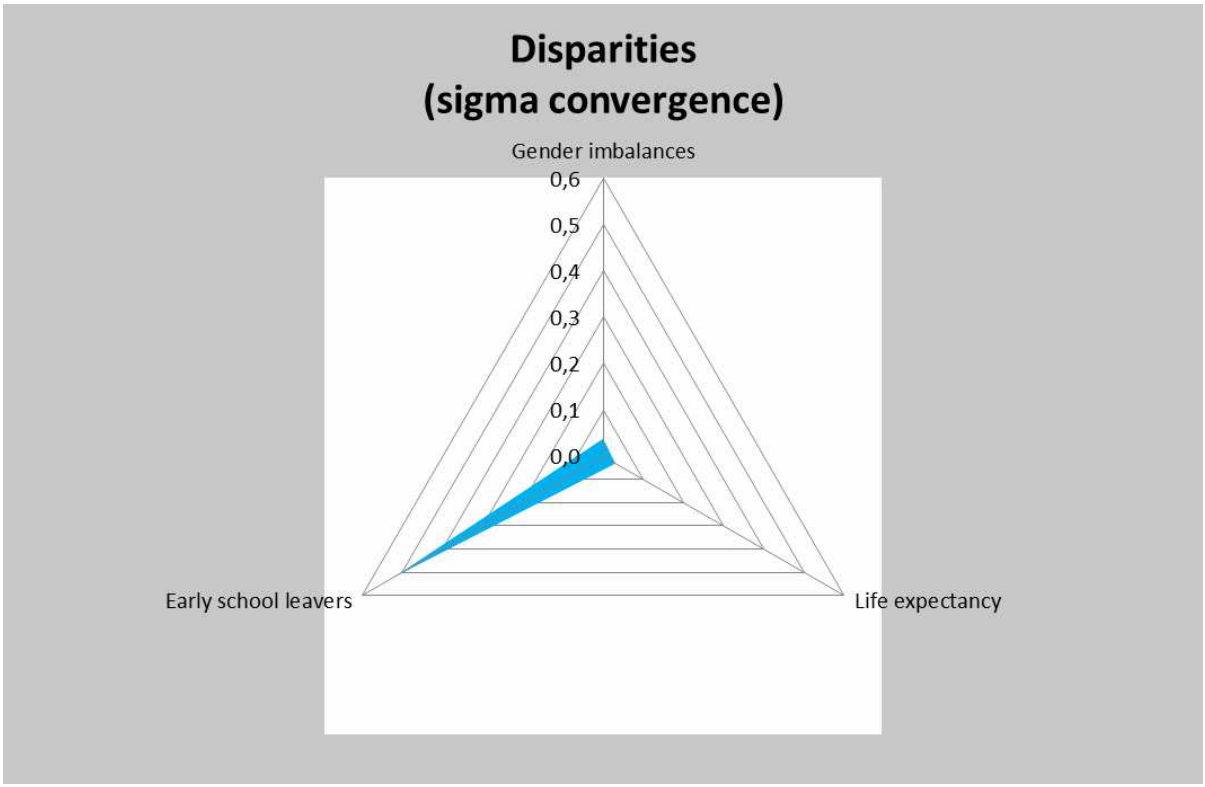


Figure 82. Degree of actual disparities for indicators under Territorial objective "Inclusion and quality of life"

C.3.5. Attractive regions of high ecological values and strong territorial capital

Sustainable growth is an essential pillar of Europe 2020 Strategy. It aims at decoupling economic and demographic growth from energy consumption, for a resource efficient and sustainable economy. Renewable and low-carbon energy are also underlined in TA 2020, which puts more emphasis on joint risk management and cooperation, especially to protect natural and cultural heritage. More than only conservation of European landscapes, there is a need to put quality forward and to make the best use of natural and cultural assets. This will in turn reinforce territorial capital and attractiveness of regions, for a long-term development based on well-functioning ecological systems (TA 2020).

Four indicators are proposed as territorial cohesion indicators under this objective:

- Potential vulnerability to climate change
- Air pollution: PM10
- Air pollution: Ozone concentration
- Soil sealing per capita

These indicators are dedicated to measure the emissions and soil sealing resulting from human behaviour, as well as the general vulnerability of regions to climate change as outcome of human behaviour and adaptation capacities on the one hand, and their climatic, topographic, geological and biological conditions on the other hand. Other wishlist indicators under this territorial objective include mortality, risk and hazards, biodiversity or renewable energy potential (see Chapter B.4.1, wishlist for more information).

Due to a lack of time series information, analyses of sigma and beta convergences could not be performed so far for this indicator set.

The indicator on potential vulnerability to climate change is a composite indicator calculated by ESPON Climate project. The potential impacts were calculated as a combination of regional exposure to climate change (difference between 1961-1990 and 2071-2100 climate projections) of eight climatic variables. Results are classified into five classes (highest negative impacts, medium negative impacts, low negative impacts, no/marginal impact, and low positive impact). Even though it is debatable whether individual impacts of climate change are to be considered a bad or a good thing, from a territorial cohesion perspective it is argued here that exposures to anticipated climate change is binding significant political, human and eventually also financial resources. Regions that will experience climate change, will thus in future be required to spend time and efforts over proportionally to adaptation strategy, compared to other regions that can spend their resources more widely.

Basic air pollution data particular matter (PM10) and ozone concentration are provided by the European Environment Agency (EEA, Copenhagen) as raster datasets. Thus, following are two types of air pollution maps: one map showing aggregated results at NUTS level, and another map, produced by EEA, at grid level.

Potential vulnerability to climate change

Theme:

0803 ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARD, climate change

Policy relevance:

This indicator measures the overall vulnerability of regions in Europe to climate change, accounting for the sensitivity and adaptation capacities of regions and their regional/local government preparedness to adapt to climate change when confronted to cases of extreme climatic events.

Desired direction of change:

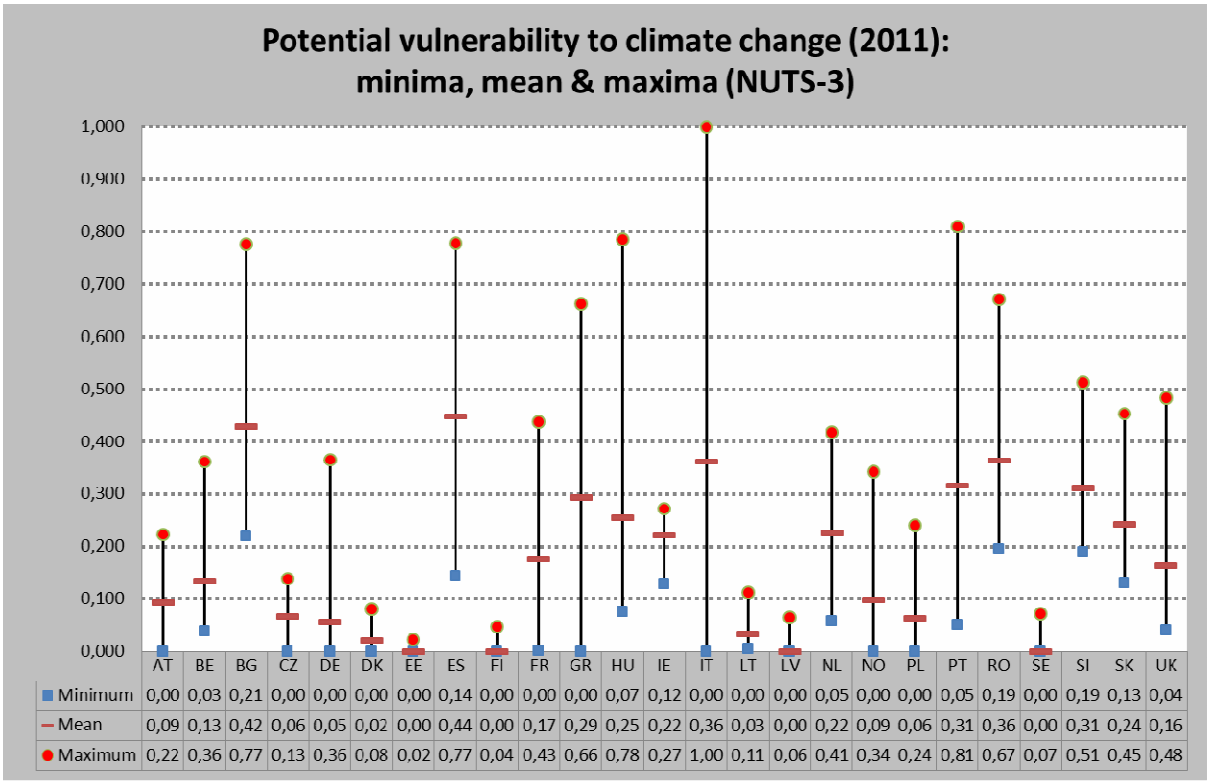
The potential vulnerability to climate change should be reduced, especially the socio-economic sensitivity to exposures to extreme climatic events. Regions with medium or high vulnerability to climate change should introduce suitable measures helping to reduce negative impacts through climate change.

Description:

Generally it is expected that regions around the Mediterranean Sea experience higher potential vulnerability to climate change, compared to regions in Central Europe and Northern Europe. All regions in Portugal, Spain, Italy, Greece, Bulgaria and Romania are likely to experience medium or even high negative impacts through climate change, so as do coastal regions in the Benelux. Regions in France, Slovakia, Western Germany and the UK and Ireland show low negative overall climate change impacts.

Apart from these general disparities in Europe, there are also significant disparities within the countries. Interestingly, countries around the Mediterranean Sea are at the same time those countries that also show the largest internal disparities, since within these countries (Greece, Italy, Portugal, and Spain) there are regions who experience no or only marginal impacts (index values close to 0), contrasted to other regions who are expected to experience severe impacts (index values close to 1). There is a tendency in most countries to experience negative impacts, for some countries in the low or medium range (Slovakia, Hungary, southern parts of Poland, UK), for other in the medium to high range (Bulgaria, Romania, Slovenia). Only few regions in selected countries such as in Austria, Czech Republic, Germany, Scandinavia, and the Baltic States are expected to experience no or only marginal impacts from climate change. Potential vulnerability of these countries is expected to be lower compared to the other countries, not only because of lower natural impacts, but also because these countries are expected to better adapt to the (political) challenges to respond to climate change processes.

Summing up, the indicator on potential vulnerability to climate change first of all highlights the big gap between Mediterranean countries, west European countries (Ireland, France, UK) and the rest of Europe, but on a second level it also illustrates significant disparities within many countries, with regions experiencing no or only marginal impacts, compared to those that are likely to experience significant impacts through climate change.



	AT	BE	BG	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LV	NL	NO	PL	PT	RO	SE	SI	SK	UK
Minimum	0,00	0,03	0,21	0,00	0,00	0,00	0,00	0,14	0,00	0,00	0,00	0,07	0,12	0,00	0,00	0,00	0,05	0,00	0,00	0,05	0,19	0,00	0,19	0,13	0,04
Mean	0,09	0,13	0,42	0,06	0,05	0,02	0,00	0,44	0,00	0,17	0,29	0,25	0,22	0,36	0,03	0,00	0,22	0,09	0,06	0,31	0,36	0,00	0,31	0,24	0,16
Maximum	0,22	0,36	0,77	0,13	0,36	0,08	0,02	0,77	0,04	0,43	0,66	0,78	0,27	1,00	0,11	0,06	0,41	0,34	0,24	0,81	0,67	0,07	0,51	0,45	0,48

Figure 83. Potential vulnerability to climate change - min. mean and max.

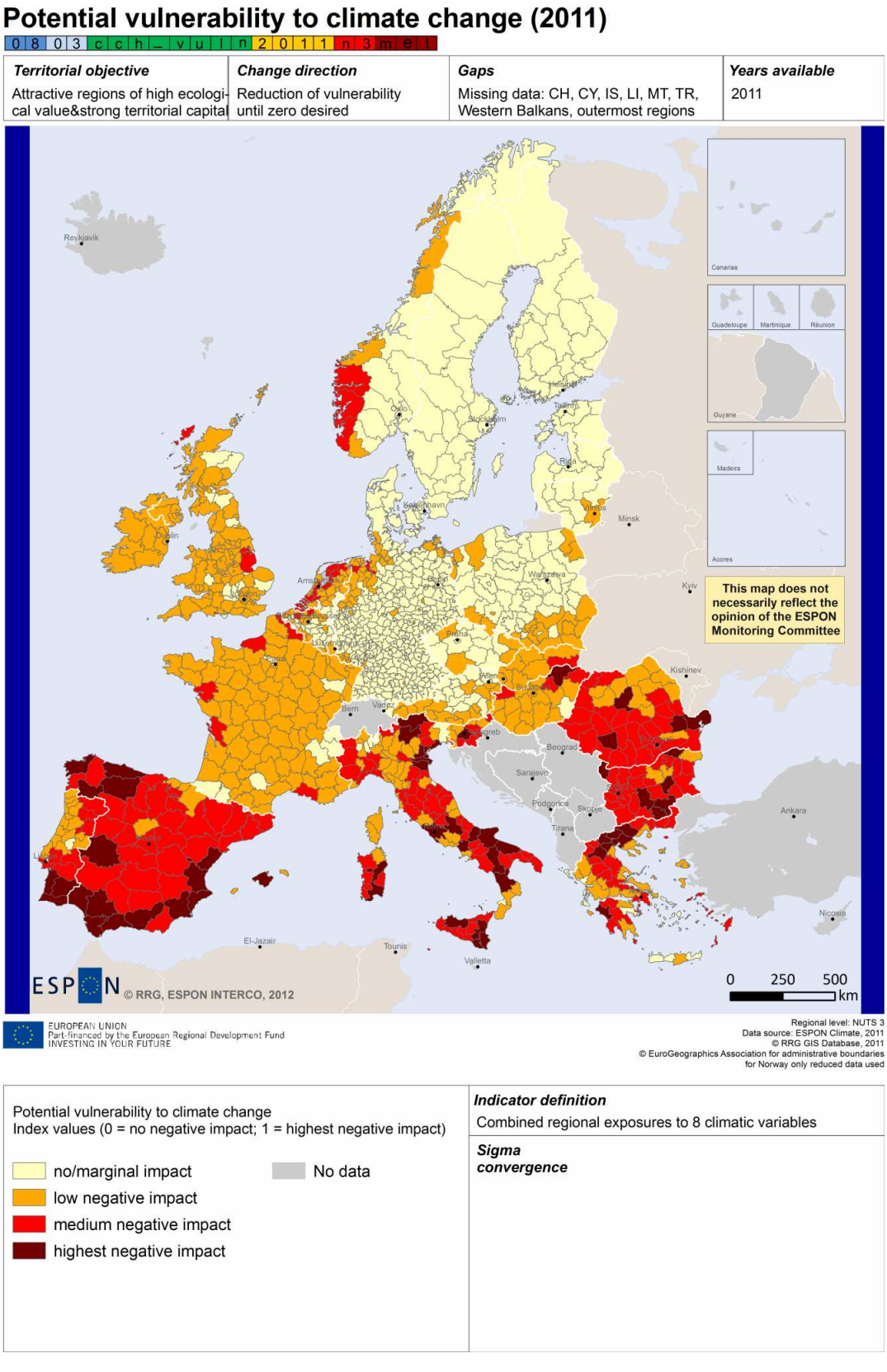
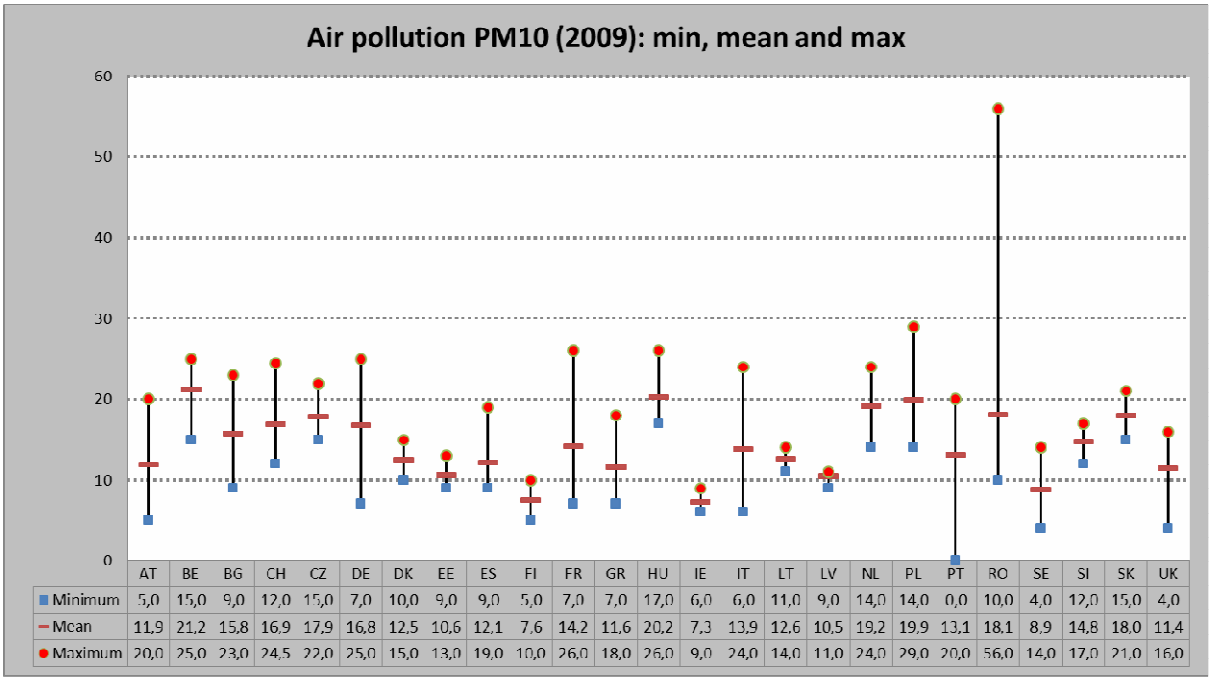


Figure 84. Indicator - potential vulnerability to climate change

Air pollution: PM10

Theme: 0801 ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS. Environment quality
Policy relevance: This indicator witnesses global warming and climate change processes. A reduction of greenhouse gas emissions, ozone concentrations, etc. is a political priority. The indicator tries measuring the degree of reductions in emissions for healthier natural living environments.
Desired direction of change: Generally a reduction of the pollutions until zero is desired.
Description: Northern Scandinavia, as well as some few regions in the Alpine arc, in Southern France, Northern Spain and Scotland show very low PM10 concentrations (Figure 85, Figure 86 and Figure 87). All other regions still experience rather high concentrations, not only in the old EU Member States, but in particular also in the new ones, such as regions in Poland, Hungary or Romania (Figure 86, Figure 87). While the map at NUTS level is levelling out some outliers, the grid level map shows very distinct spatial patterns in Europe, where we can see some hot spots of air pollution in agglomerations (for instance, Athens, Madrid, Roma, Brussels) compared to their sorroundings. The highest spatial disparities can be found in Romania (Figure 85), followed by Portugal, France, Italy and Germany. Particular low disparities within countries can be observed for Czech Republic, Denmark, the Baltic states, the Netherlands, Slovenia and Slovakia.



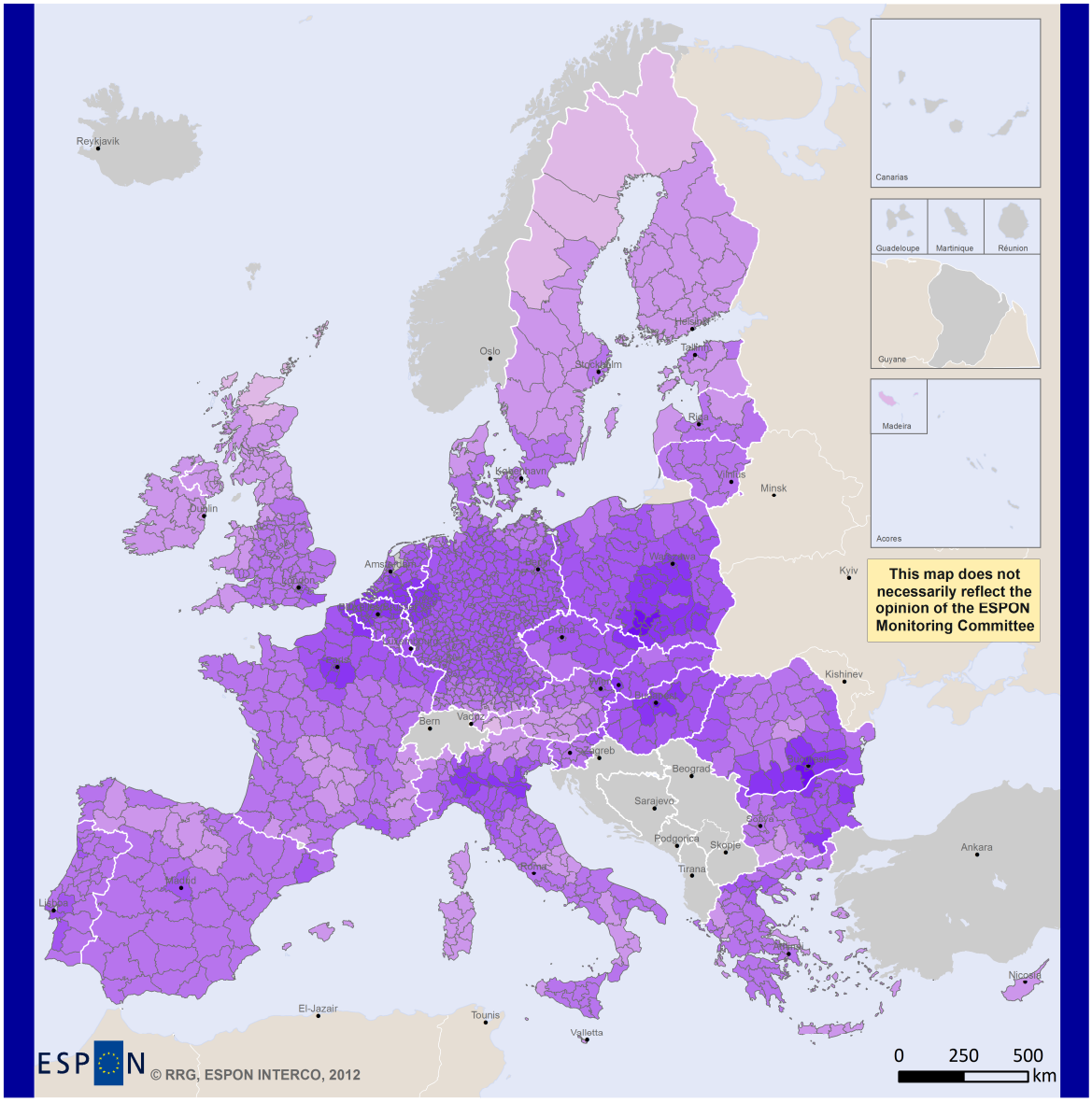
	AT	BE	BG	CH	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LV	NL	PL	PT	RO	SE	SI	SK	UK
Minimum	5,0	15,0	9,0	12,0	15,0	7,0	10,0	9,0	9,0	5,0	7,0	7,0	17,0	6,0	6,0	11,0	9,0	14,0	14,0	0,0	10,0	4,0	12,0	15,0	4,0
Mean	11,9	21,2	15,8	16,9	17,9	16,8	12,5	10,6	12,1	7,6	14,2	11,6	20,2	7,3	13,9	12,6	10,5	19,2	19,9	13,1	18,1	8,9	14,8	18,0	11,4
Maximum	20,0	25,0	23,0	24,5	22,0	25,0	15,0	13,0	19,0	10,0	26,0	18,0	26,0	9,0	24,0	14,0	11,0	24,0	29,0	20,0	56,0	14,0	17,0	21,0	16,0

Figure 85. PM10 air pollution – minima, mean and maxima

Air pollution: PM10 (2009)

0 8 0 1 a p p m 1 0 _ _ 2 0 0 9 n 3 m e t

Territorial objective	*Change direction*	*Gaps*	*Years available*
Attractive regions of high ecological value&strong territorial capital	Reduction of pollutions until zero desired	Missing data: CH, IS, LI, NO, TR, Western Balkans, outermost regions	2009



Yearly average (yg/m3)

0 - 5	16 - 20	No data
6 - 10	21 - 25	
11 - 15	26 - 56	

Indicator definition

PM10 concentration at surface level, weighted by population

Sigma convergence

Figure 86. Indicator – PM10 air pollution.

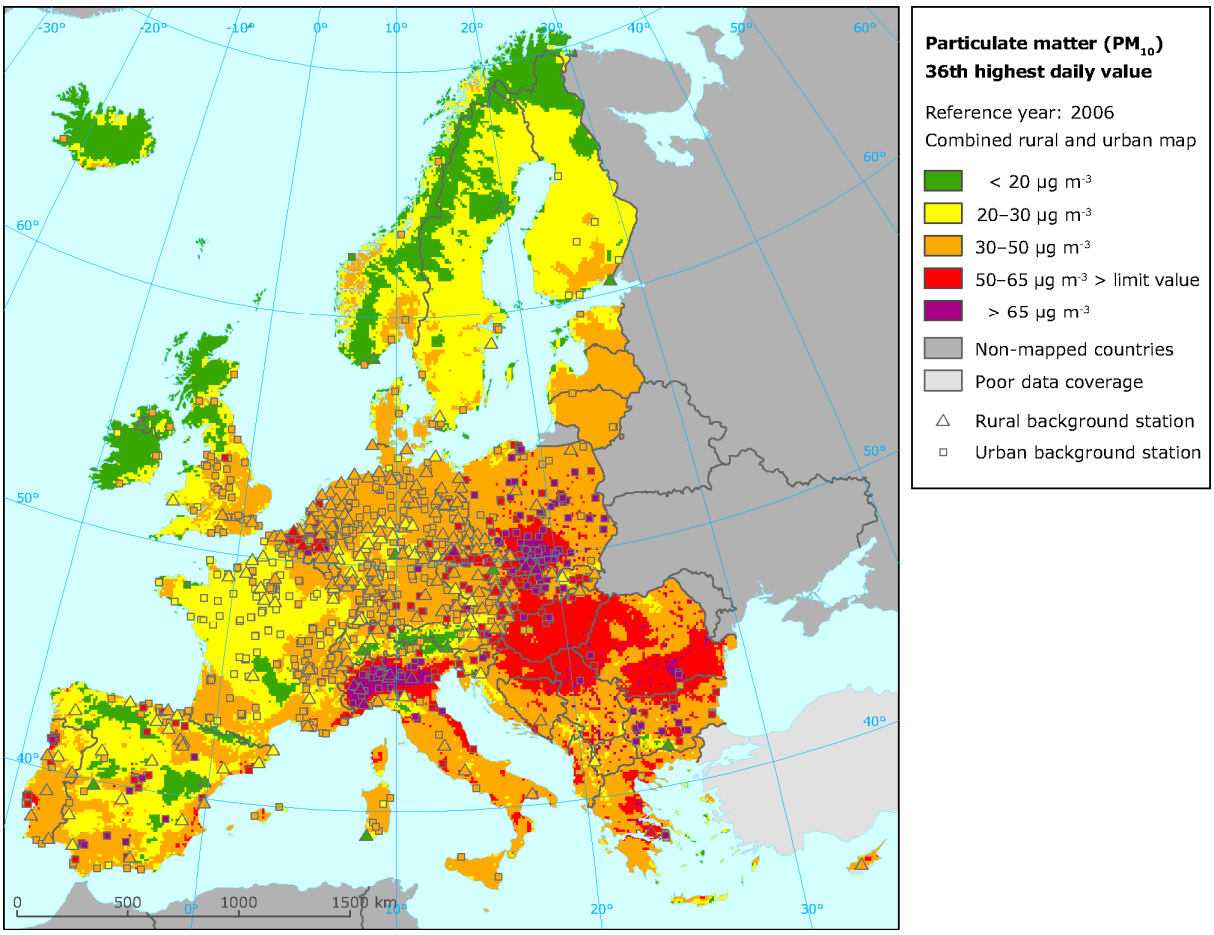


Figure 87. Indicator – PM10 air pollution at grid level (EEA, 2011)

PM10 showing the 36th highest daily values at urban background sites superimposed on rural background concentrations, 2006.

Air pollution: Ozone concentration

Theme:

0801 ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS. Environment quality

Policy relevance:

This indicator witnesses global warming and climate change processes. A reduction of greenhouse gas emissions, ozone concentrations, etc. is a political priority. The indicator tries measuring the degree of reductions in emissions for healthier natural living environments.

Desired direction of change:

Generally a reduction of air pollutions until zero is desired, so that the number of days with ozone concentration exceedances decrease.

Description:

For many countries the general number of days with Ozone concentration exceedances with less or equal 5 days is rather low (Figure 88; Scandinavia, Ireland, Spain, Baltic States, Poland); however, there are remarkable exceptions, such as Italy, Bulgaria and Romania and parts of Greece, experiencing highest number of days with concentrations above threshold levels with partly more than 100 days. The latter ones are also the countries with the highest disparities of exceedances within the countries (Figure 90), i.e. there are regions with rather good air quality (such as Western parts of Greece and Romania), but there are in contrary also regions with extremely bad air quality in the same country. At grid level, the general picture at NUTS level is reproduced, but partly even more accentuated (Figure 89). Generally, the maximum daily 8-hour average is higher the farther south a region is located, i.e. regions at Mediterranean Sea suffer most from Ozone concentrations. In contrary, the farther North a region is located the better the air quality is. But there are also exceptions from this general picture: there are also rural and urban background stations indicating local hot spots of Ozone concentrations across Europe, so as there are also local stations along the Mediterranean coast with rather low concentration levels. Altogether, from the EEA grid data, Iceland, Ireland and the UK generally appear as the areas with the best air qulity.

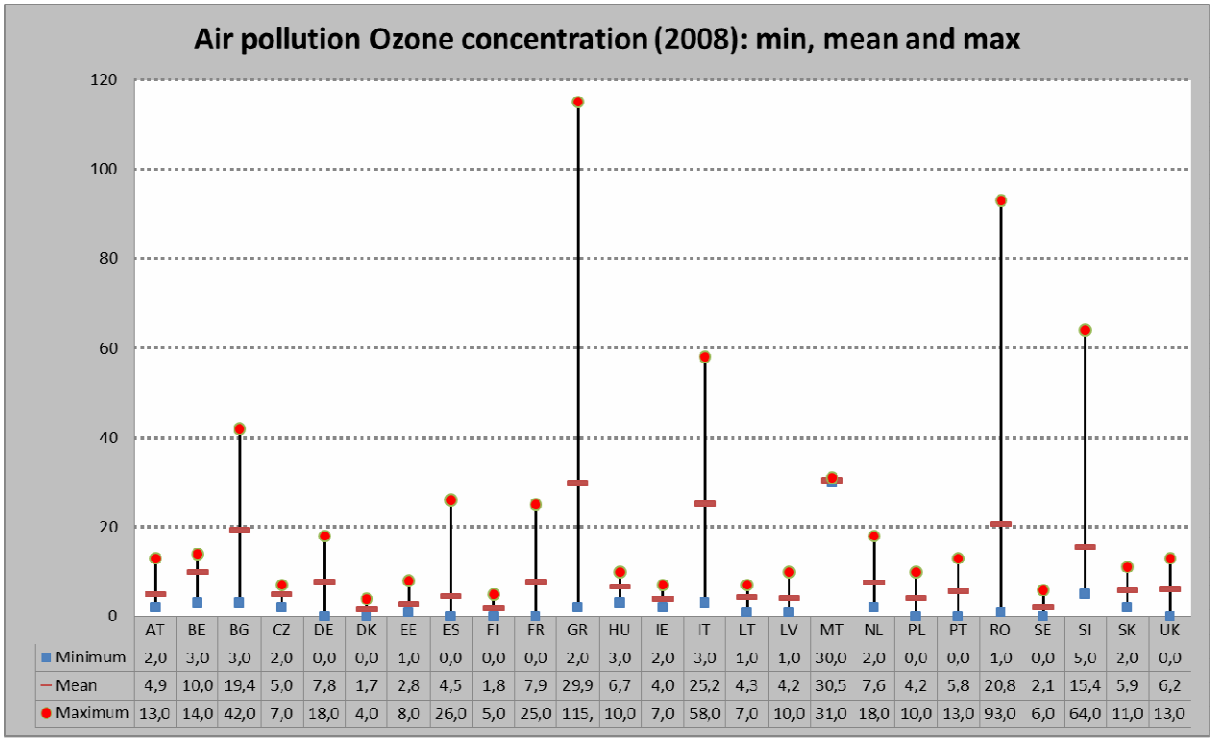


Figure 88. Air pollution: Ozone concentration exceedances – Minima, mean and maxima

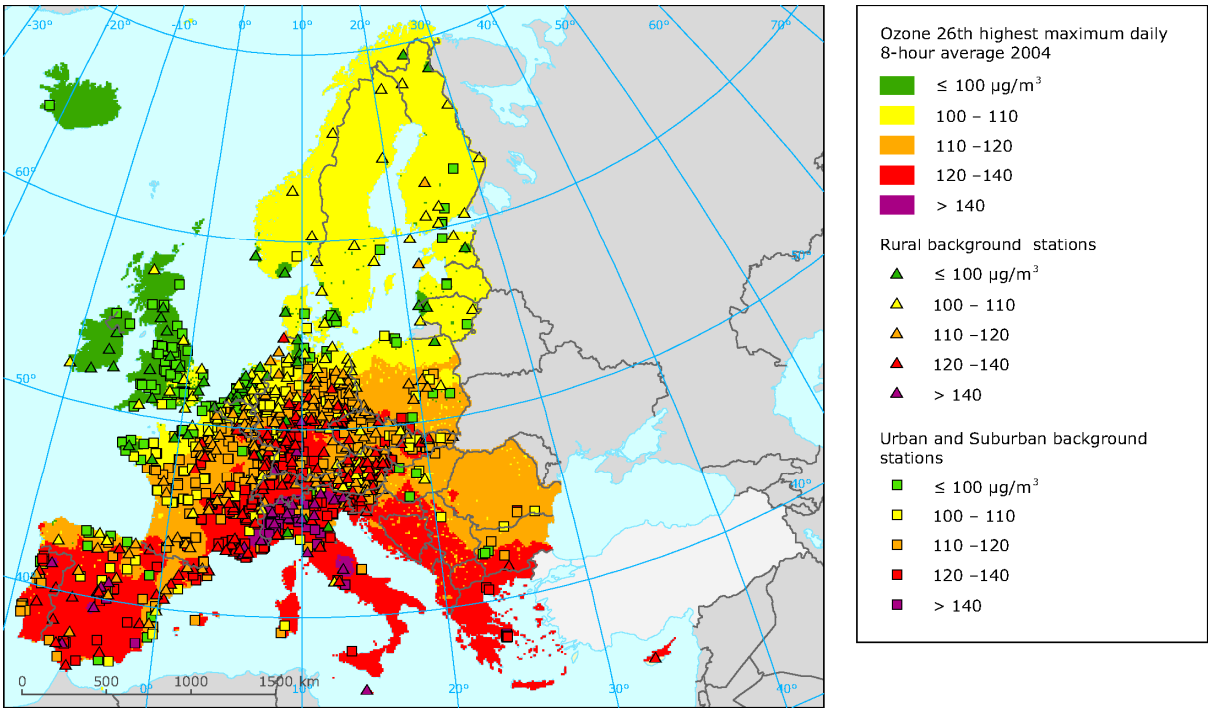
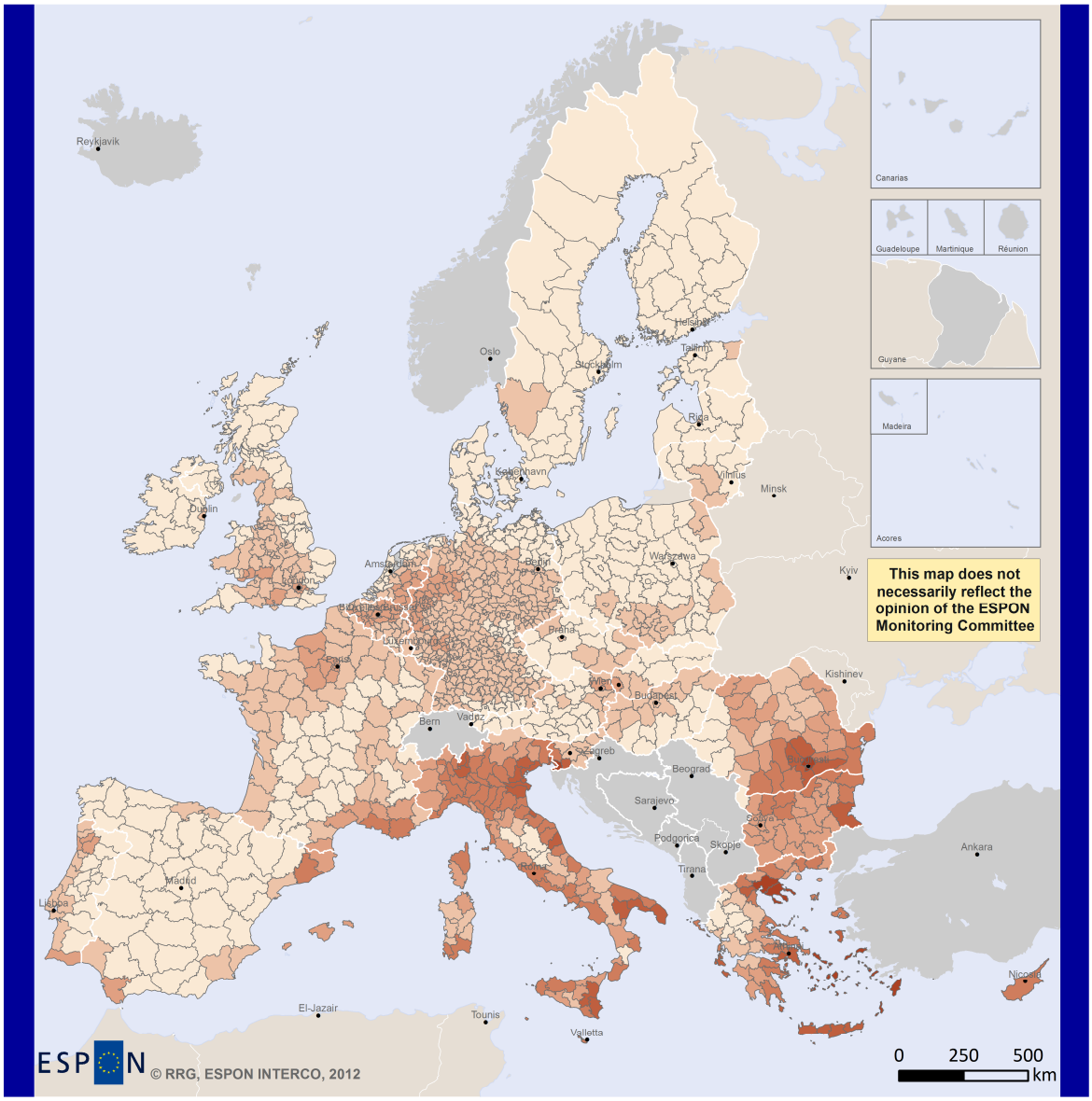


Figure 89. Indicator – Ozone concentration (EEA, 2011). Ozone 26th highest maximum daily 8-hour average 2004.

Air pollution: Ozone concentration (2008)

0 8 0 1 a p o z o n e _ 2 0 0 8 n 3 m e t

Territorial objective	*Change direction*	*Gaps*	*Years available*
Attractive regions of high ecological value&strong territorial capital	Reduction of exceedances until zero desired	Missing data: CH, IS, LI, NO, TR, Western Balkans, outermost regions	2008



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Days with Ozone concentration exceedances

0 - 5	21 - 40	No data
6 - 10	41 - 60	
11 - 20	61 - 115	

Indicator definition

Days with ground level concentration >120 yg/m3

Sigma convergence

Figure 90. Indicator – Ozone concentration exceedances

Soil sealing per capita

Theme:

0803 ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS. Climate change

Policy relevance:

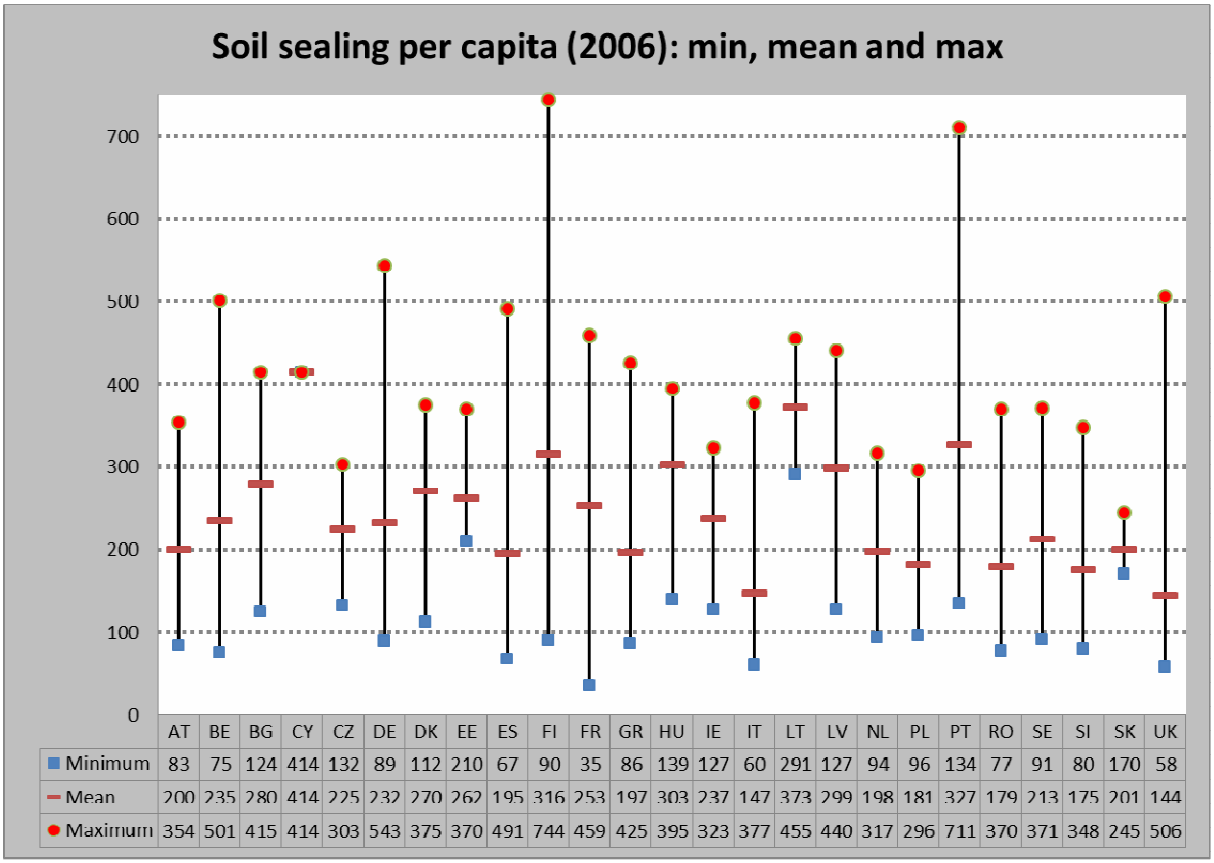
This indicator measures the degree of de-coupling of economic/demographic development and land take. Concentration of constructions (i.e. reduction of land take) prevents from natural hazards and preserve ecological functions and values.

Desired direction of change:

Generally, decrease in soil sealing per capita is desired down to the absolute minimum level.

Description:

Differences in land take per capita are quite significant for all countries leading to a very diverse spatial pattern in Europe (Figure 92). Hot spots of soil sealing per capita are East Germany, Portugal, Western parts of Finland, Cyprus, parts of the Baltic States and some regions in France. On the contrary, soil take in Italy, the UK, Romania, Poland, in large parts of Spain and in West Germany and East Finland is modest. This diverse picture leads to big value ranges between minimum and maximum for each country; while some countries like Italy or the UK are on good track on average towards a reduction of annual soil sealings, other countries like Finland, Portugal, Belgium or Germany face two problems of (i) generally decrease overall soil sealing, and (ii) reduce the big gap between regions taking most land and those taking the least land (Figure 91).



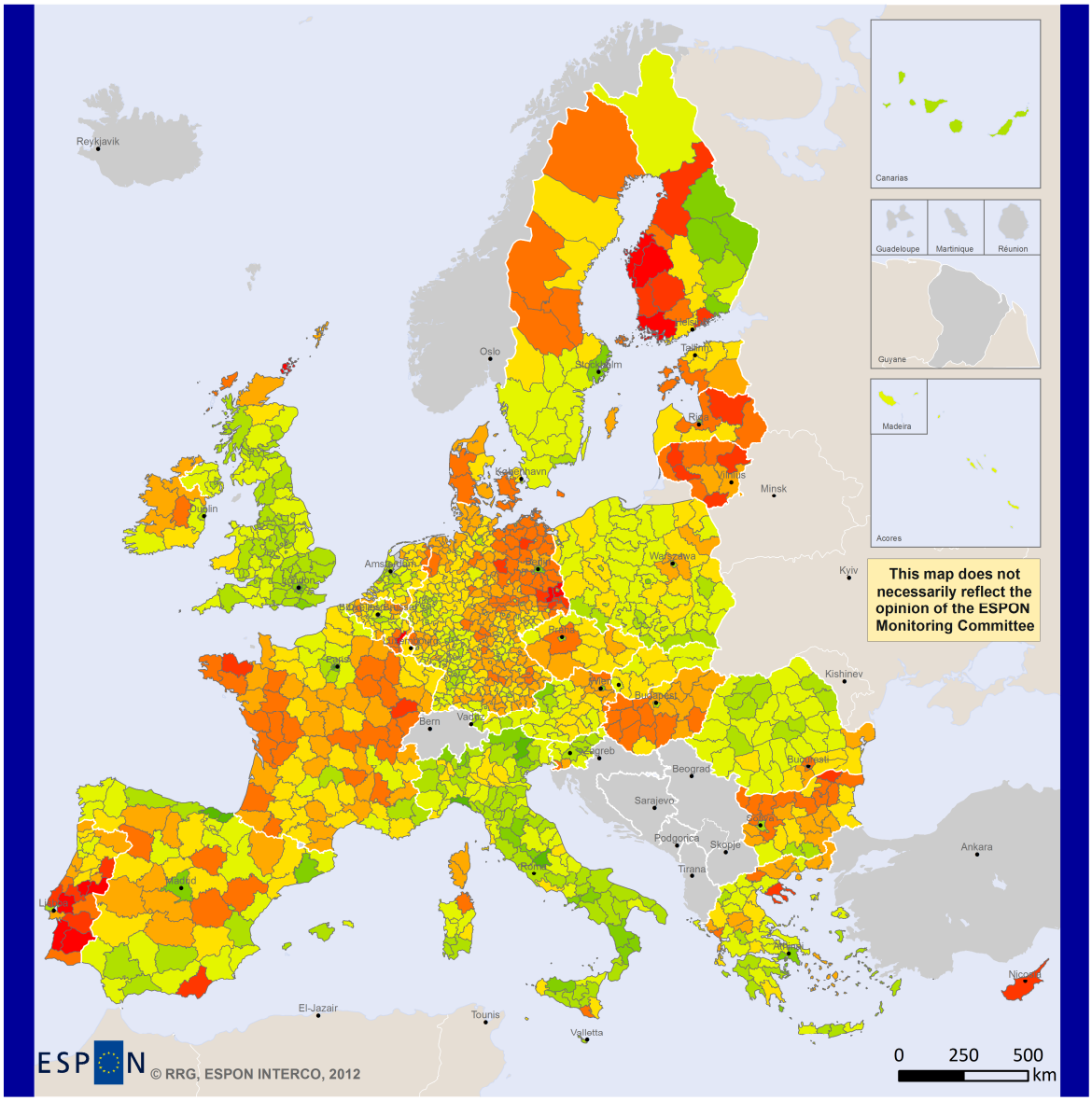
	AT	BE	BG	CY	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IT	LT	LV	NL	PL	PT	RO	SE	SI	SK	UK
Minimum	83	75	124	414	132	89	112	210	67	90	35	86	139	127	60	291	127	94	96	134	77	91	80	170	58
Mean	200	235	280	414	225	232	270	262	195	316	253	197	303	237	147	373	299	198	181	327	179	213	175	201	144
Maximum	354	501	415	414	303	543	375	370	491	744	459	425	395	323	377	455	440	317	296	711	370	371	348	245	506

Figure 91. Soil sealing by country – minima, mean and maximum by country

Soil sealing per capita (2006)

0 8 0 3 s o i l s e a l 2 0 0 6 n 3 r t d

Territorial objective	*Change direction*	*Gaps*	*Years available*
Attractive regions of high ecological value&strong territorial capital	Decrease desired until absolute minimum	Missing data: CH, IS, LI, NO, TR, Western Balkans, French overseas d.	2006



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sqm per inhabitant

35 - 50	201 - 250	No data
51 - 75	251 - 300	
76 - 100	301 - 400	
101 - 150	401 - 500	
151 - 200	501 - 750	

Indicator definition

New annual soil sealing through land take

Sigma convergence

Figure 92. Indicator – Soil sealing per capita.

Summary

What are the territorial disparities of the indicators selected for the territorial objective of attractive regions of high ecological values and strong territorial capital? And how have these indicators developed over the last decade?

The desired thresholds (target values or desired direction of change) for all four indicators can only be reached for a small number of regions. Despite a big gap between Mediterranean countries, west European countries and the rest of Europe concerning the potential vulnerability to climate change, many regions are likely to experience significant impacts. As for PM10 pollution, many regions in Europe still have rather high concentrations, even though differences within a country are rather low, contrary to the previous indicator. In case of Ozone concentration the analysis reveals that the number of days with concentration exceedances is quite low for most of European regions, with some remarkable exceptions, reflecting measures implemented over the last decade for improving the air quality; however, some countries like Italy, Romania or Bulgaria still have to improve their air quality levels. Soil sealing illustrates the most heterogeneous picture in Europe, with regions experiencing extremely high land take, and other regions with very modest land take rates per capita. Territorial disparities are extremely high within the countries, as well as between them.

So from a territorial cohesion perspective, the indicator on Ozone concentration already presents the smallest spatial disparities, followed by PM10, while soil sealing still yield very high disparities.

Unfortunately, time series data are not available until today for none of the four indicators presented, so no assessment can be given on the development trends of these indicators over recent years. From an environmental point of view it would nonetheless be important to keep track of these indicators over time, so it is recommended in the wishlist (chapter B.4.1. Wishlist) to collect such datasets regularly over time periods allowing assessing the development trends.

C.3.6. Integrated polycentric territorial development

"*Polycentric and balanced territorial development of the EU is key element of achieving territorial cohesion*". Taking up the main priority of ESDP, TA 2020 promotes a polycentric pattern at macro-regional, cross-border, national and regional level that should reduce the strong territorial polarisation. The aim is to encourage competitiveness and attractiveness outside the Pentagon area thanks to extended networks between centers of different scales. Concentration and connection are the main challenges of polycentrism, as on one hand they help achieving a critical mass and allow surrounding areas to benefit from agglomeration effects, and on the other hand they may have negative externalities, especially in larges cities. As already underlined by the Green Paper, cooperation between territories is an important factor to tackle these issues and for having a real integrated territorial development. This implies not only well connected centers of different weights but also to have

coordinated strategies and to overcome divisions due to borders, moreover in transnational functional areas.

Four indicators are proposed as territorial cohesion indicators under this objective:

- Population potential within 50 km
- Net migration rate
- Cooperation intensity in INTERREG program period 2000-2006
- Cooperation degree in INTERREG program period 2000-2006

These indicators are dedicated to measure basic territorial market potentials and territorial structures (population potential within 50 km), attractiveness of a region for in-migration and to keep population (net migration rate), and the degree of collaborations with partner regions (cooperation intensity and cooperation degree).

The indicator “Population potential within 50 km” is defined as the number of people within reach of 50 km airline distance for a system of 2.5 x 2.5 km raster grid cells. For each cell the reachable population was calculated. This potential indicates the “daily life” type of service provision that requires certain minimum potential within reasonable distance or travel time, if the origin becomes a center for private or public service provision. This indicator, at grid level, furthermore illustrates territorial structures with city centres or agglomerations appearing as ‘peaks’ or ‘plateaus’, and rural or remote areas appearing as ‘basins’. This indicator was first developed in the EU Parliament Cohesion Study (Dubois, 2007) at raster level. Within INTERCO, the results were aggregated to NUTS2/3 level. In order to highlight regions that are above or below the European average, the indicator has furthermore been standardised at the EU27 average.

The two indicators on cooperation intensity and cooperation degree have been developed by the ESPON TERCO project. They indicate the cooperation intensity and cooperation degree of regions in INTERREG IIIc projects for the program period 2000-2006. Due to a lack of time series data, analyses of sigma and beta convergences could not be performed so far for none of the indicators under this objective.

Population potential within 50 km

Theme:

1002 TERRITORIAL STRUCTURE. Regional/territorial structure

Policy relevance:

This indicator is a proxy for the demand for provision of (public) services, for market potential and for polycentricity. A polycentric pattern with balanced concentration is essential for territorial cohesion.

Desired direction of change:

A minimum level of potential should be secured. Regions with less than 50% of European average should catch up faster.

Description:

The indicator highlights the strong population potential that lies in the most urbanised parts of Europe (Figure 94): Benelux countries, Western Germany, Southern England and Northern Italy. But more importantly, the map also highlights that territories in the new Member States, but also in other 'peripheral' parts of the Iberian Peninsula and of Scandinavia, often enjoy high population potentials. By this the importance of regional centers in Poland, Czech Republic, Hungary, Rumania or Spain becomes apparent. On the other hand, the map also shows large areas with below-average potentials, not only in Norway, Cyprus and Greece, but also in geographically more central areas in France, Spain, Austria and other parts of Europe.

Disparities at grid level within the countries are significant, not only for usual subjects like Germany, France, Italy or UK, but also for countries like Netherlands, Spain, Belgium, or Poland (Figure 93).

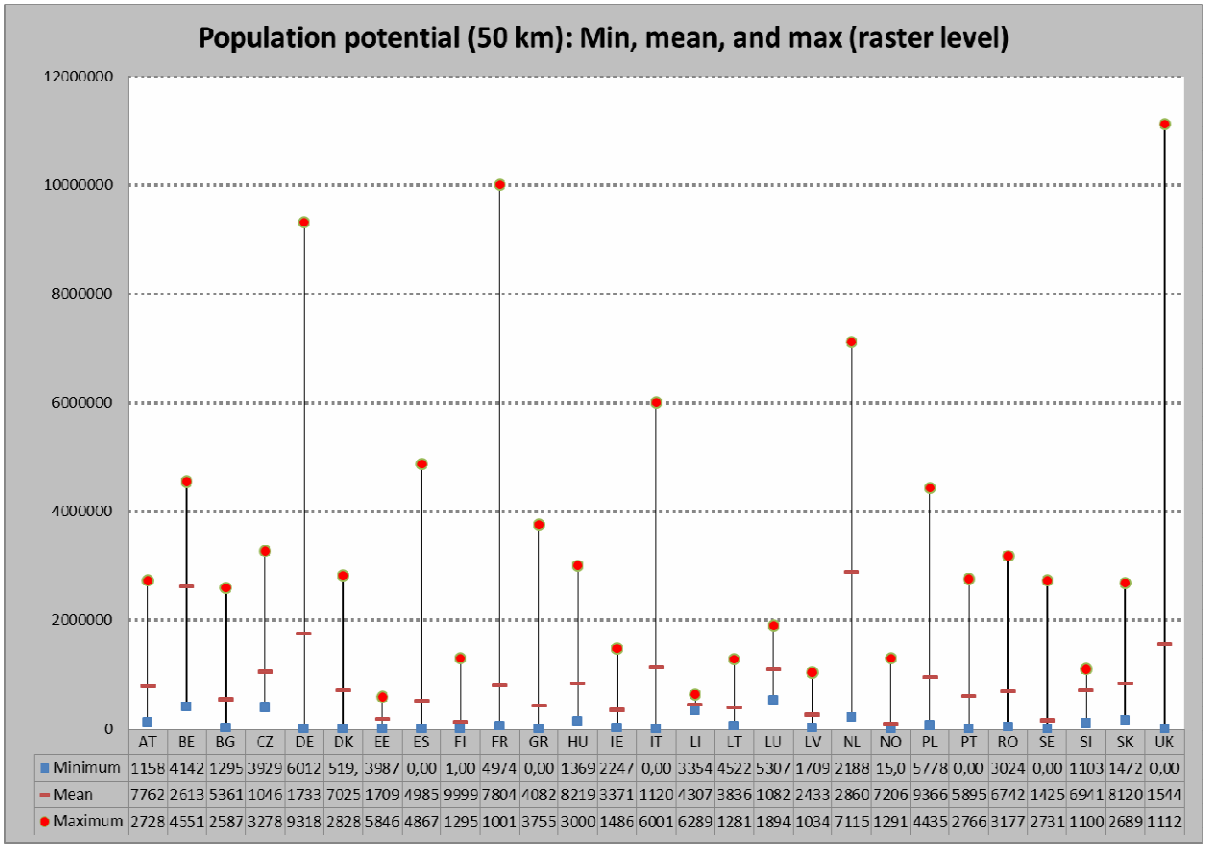
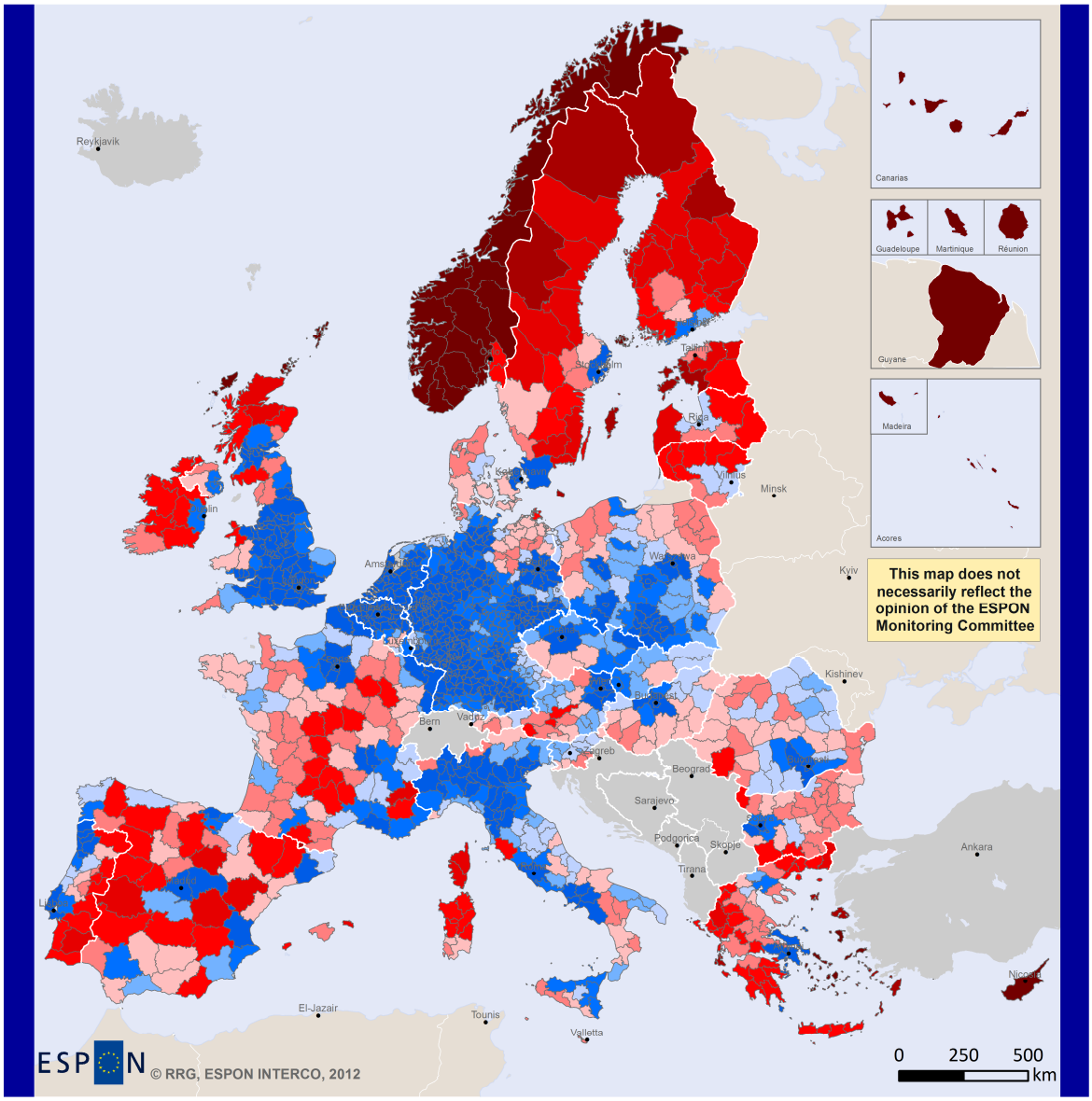


Figure 93. Population potential within 50 km – minimum, mean and maximum.

Population potential within 50 km (2008)

1 0 0 2 p o p p o t _ _ 2 0 0 8 n 3 m e t

Territorial objective	*Change direction*	*Gaps*	*Years available*
Integrated polycentric territorial development	Securing minimum potential; < 50% of EU average catch up	Missing data: CH, IS, TR, Western Balkans	2008



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EU27 = 100

below average	*above average*	
0 - 5	101 - 125	No data
6 - 10	126 - 150	
11 - 25	151 - 200	
26 - 50	201 < ...	
51 - 75		
76 - 100		

Indicator definition

Population within 50 km distance; averaged over 2.5x2.5 grid

Sigma convergence

Figure 94. Indicator –Population potential within 50 km

Net migration rate

Theme:

0202 DEMOGRAPHY. Migration

Policy relevance:

This indicator is considered as a proxy for the overall attractiveness of a region in terms of labour markets, education, quality of life, welfare, etc. It contributes to measure trends of concentration within European territory.

Desired direction of change:

Indicator should be positive, in particular in relation with negative population development and overaging.

Description:

Spatial patterns of net migration rates reveal that in the new EU Member States most regions loose population except for the capital regions and other selected agglomerations, just as Northern Scandinavia, East Germany and Northern France do in losing population; in contrary, most regions along the Mediterranean Sea attract population.

Except for Belgium, there is no single country that has only positive or only negative migration rates, i.e. all countries have regions who lose population, as well as regions who gain. Greatest disparities can be found for Spain, Bulgaria, Netherlands and the UK. Otherwise disparities for most countries are in a range of 25 percentage points.

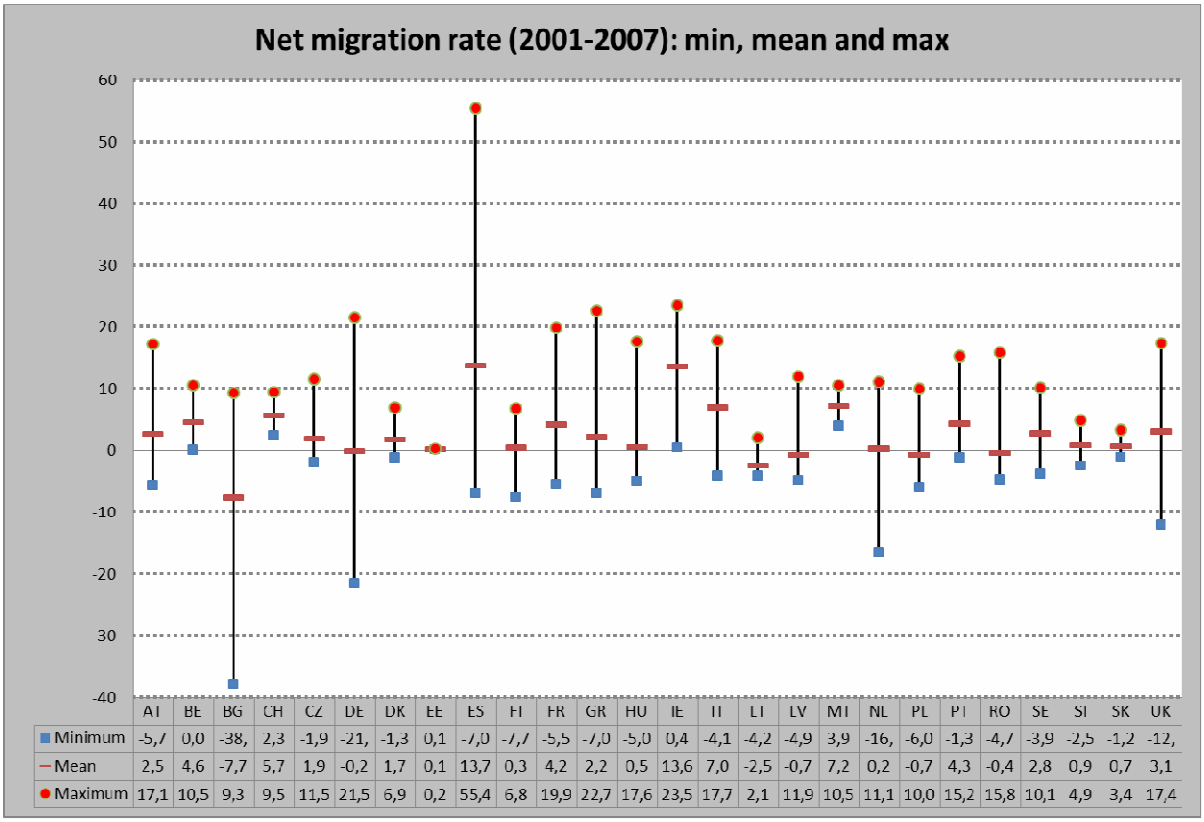
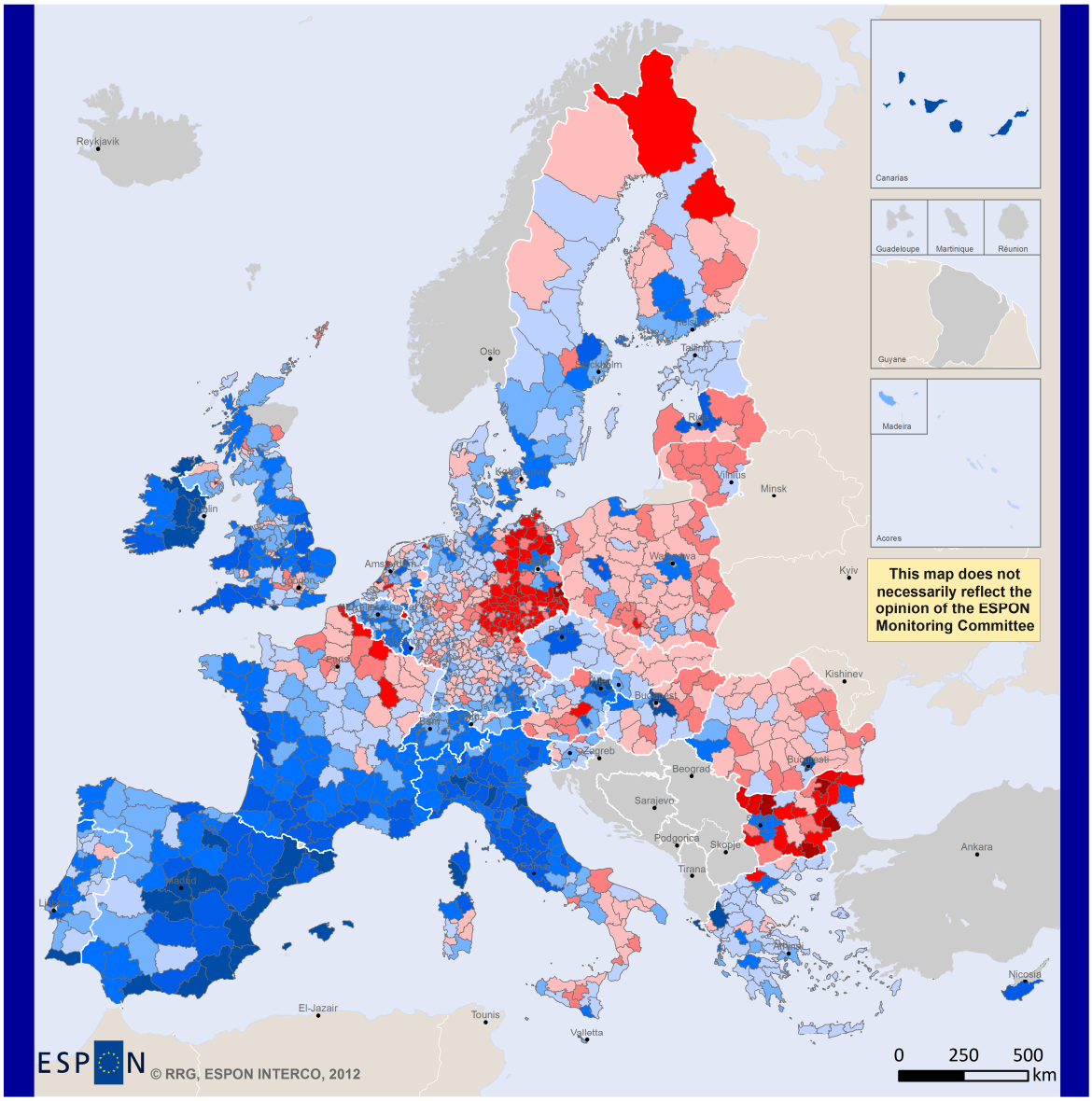


Figure 95. Net migration rates by country – minimum, mean and maximum

Net migration rate (2001-2007)

0 2 0 2 n e t m i g r _ 2 0 0 8 n 3 m e t

Territorial objective	*Change direction*	*Gaps*	*Years available*
Integrated polycentric territorial development	Rate should be positive	Missing data: IS, LI, NO, TR, UKM50, UKM62, Western Balkans, French o.d.	2007



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Data for Switzerland: own calculations based upon STAT-TAB.

in %

Net migration

negative		*positive*	
-38,0 - -15,0		0,1 - 2,5	No data
-14,9 - -10,0		2,6 - 5,0	
-9,9 - -5,0		5,1 - 10,0	
-4,9 - -2,5		10,1 - 15,0	
-2,4 - 0,0		15,1 - 55,4	

Indicator definition

Annual average of net migrants per thousand inhabitants

Sigma convergence

Figure 96. Indicator – Net migration rate

Cooperation intensity

Theme: 0901 GOVERNANCE. Governance
Policy relevance: This indicator measures the intensity each region is cooperating in terms of number of INTERREG IIIC projects in the program period 2000-2006. Cooperation and coordination on the basis of such projects can reinforce territorial integration.
Desired direction of change: Each region should have a minimum level of cooperation; regions with no or with extremely low cooperation intensity should increase their efforts in such projects.
Description: Generally the number of INTERREG IIIC projects per inhabitants is higher the smaller the population of a region is, i.e. regions in Sweden, Finland, the Baltic States, Austria, Slovenia, Greece, and Italy show the highest cooperation intensity, while regions in Western Germany, France, Poland, Romania or UK have only little intensities (Figure 98). In absolute terms (Figure 97), the cooperation intensity is varying to a high degree for all countries. In all countries except for Ireland and Slovenia, there are regions with almost null cooperations (one or two projects only), whereas on the other end of the spectrum there are also regions with high intensities of fourty or more projects (Belgium, Germany, Spain, finland, France, Greece, Hungary, Italy, Slovenia). So the disparities within the countries are quite remarkable, and are usually greater than the disparities between countries.

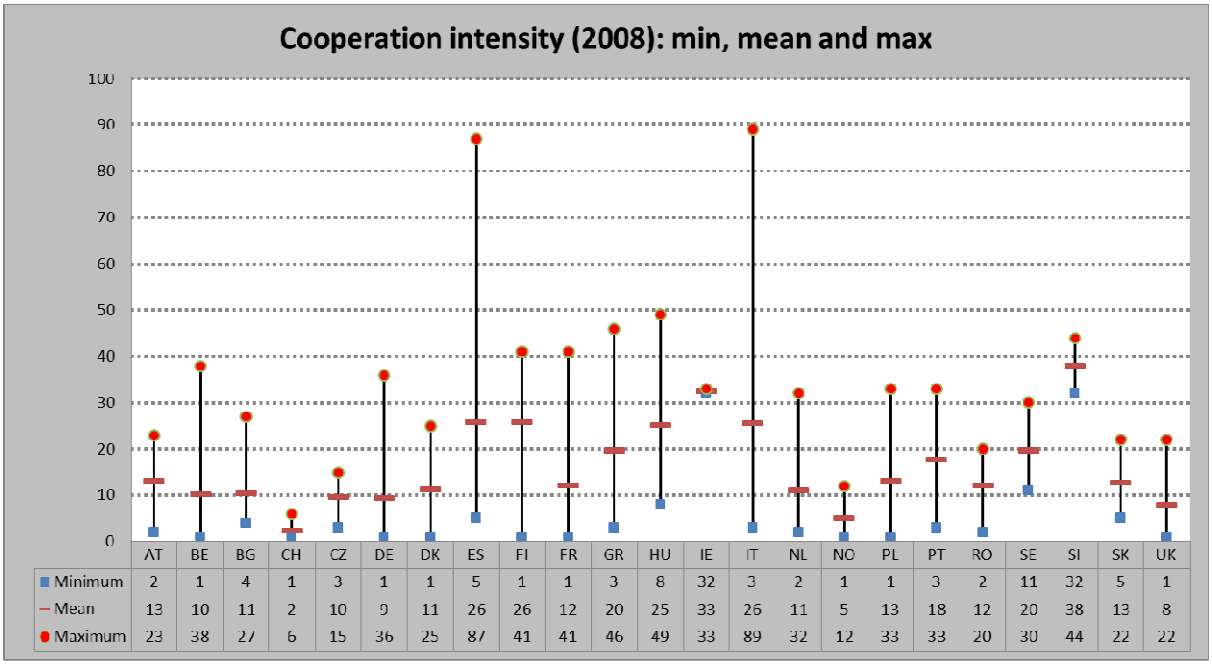
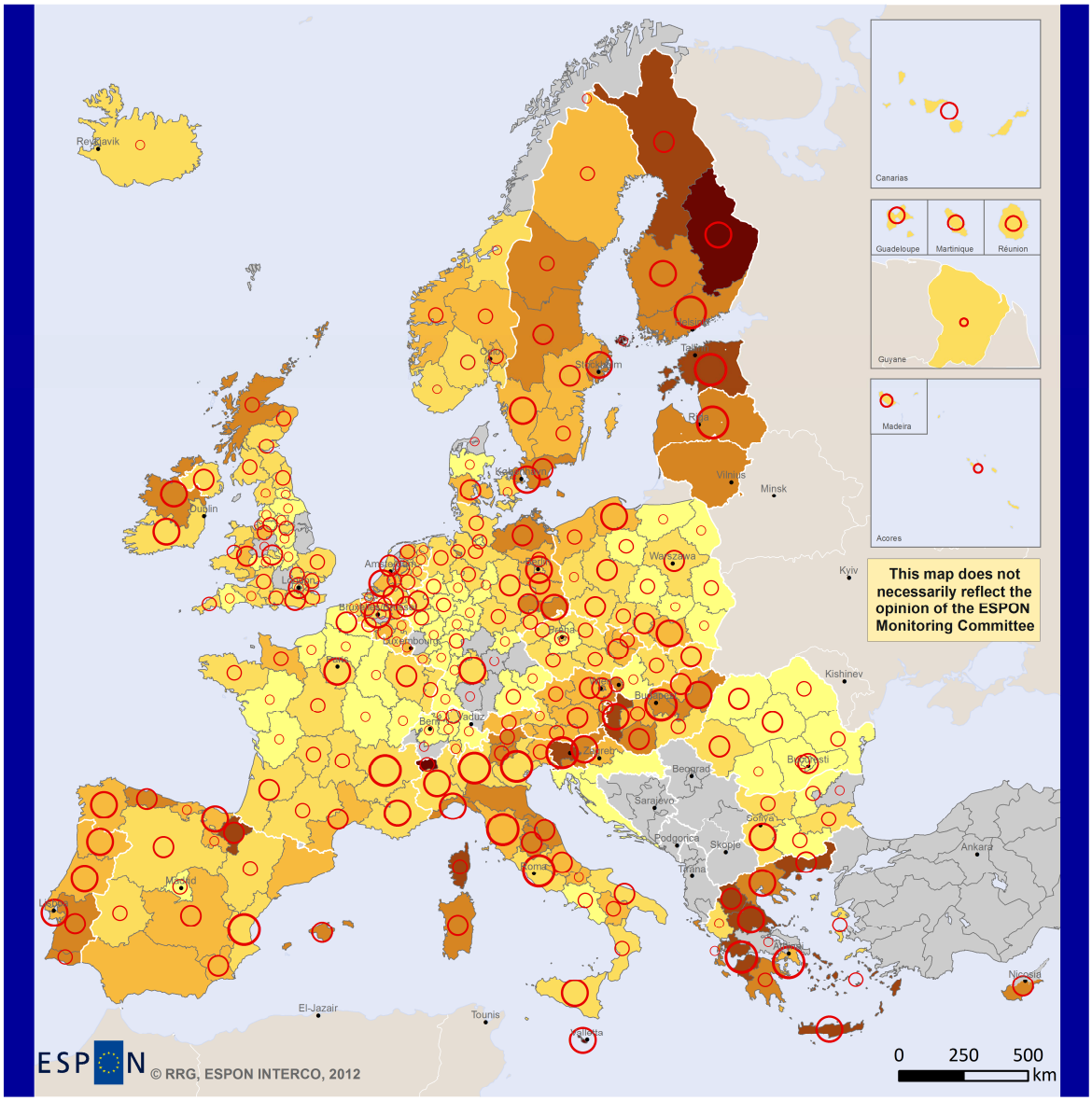


Figure 97. Cooperation intensity by country – minimum, mean and maximum

Cooperation intensity (2008)

0 9 0 1 c o o p i n t _ 2 0 0 8 n 2 m e t

Territorial objective	*Change direction*	*Gaps*	*Years available*
Integrated polycentric territorial development	Minimum level desired; increase for regions with low intensities	Missing data: LI, MK, TR, Western Balkans, regions in various countries	2008



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Projects per 100,000 inh.	*Number of projects*
0 - 2	1 - 5
3 - 6	6 - 14
7 - 10	15 - 24
11 - 20	25 - 39
21 - 35	40 - 63
36 - 65	
No data	

Indicator definition

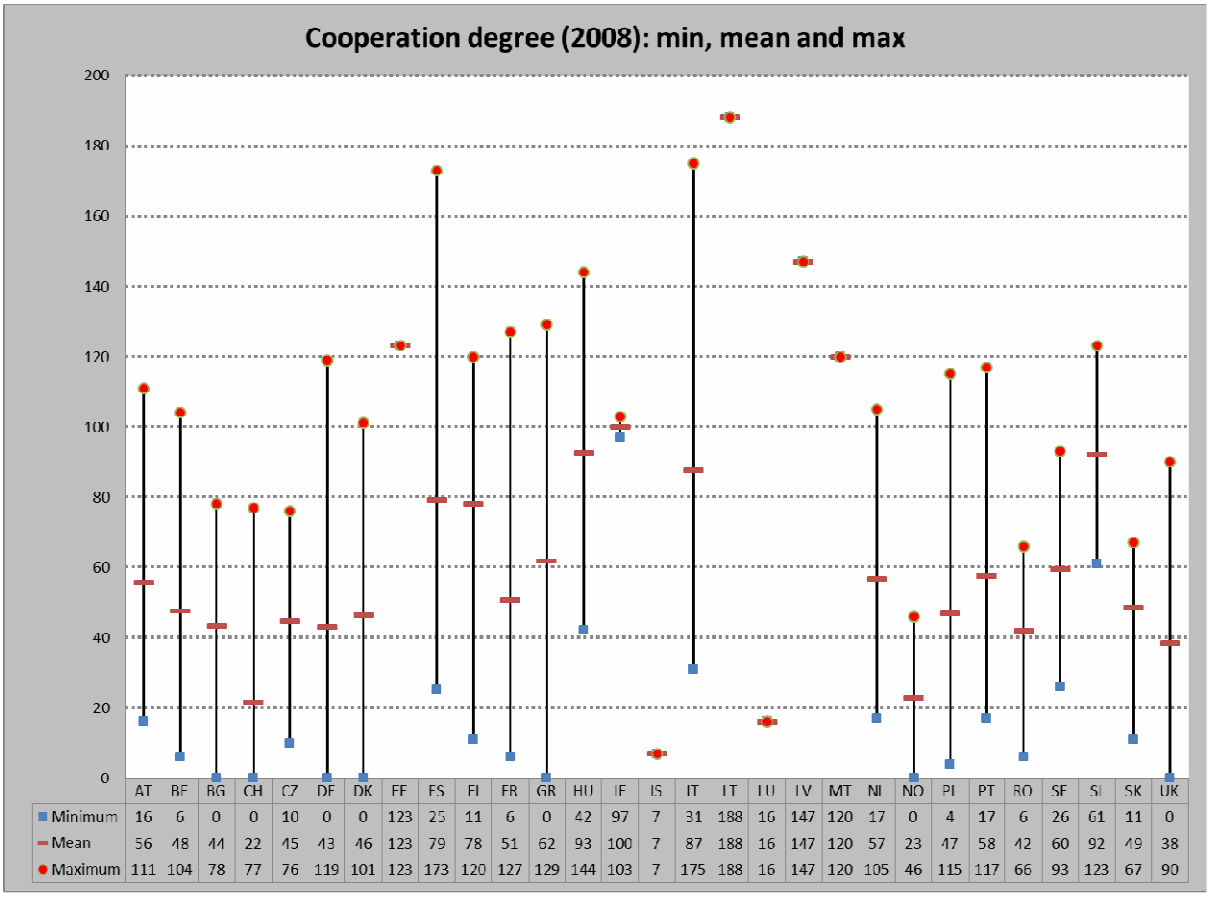
Number of INTERREG IIIC projects (abs. & per capita)

Sigma convergence

Figure 98. Indicator – Cooperation intensity (ESPON TERCO)

Cooperation degree

Theme: 0901 GOVERNANCE. Governance
Policy relevance: This indicator measures the degree of cooperation between partner regions in INTERREG IIIC projects for the program period 2000-2006. Cooperation and coordination on the basis of such INTERREG IIIC projects can reinforce territorial integration.
Desired direction of change: Each region should have a minimum level of cooperations; regions with no or with extremely low cooperation intensity should increase their efforts in such projects.
Description: The number of collaborating regions in INTERREG IIIC projects is quite different, ranging from mere 3 to 188 at maximum. While the general spatial patterns is quite heterogeneous, there is an arc of regions with highest cooperation degree ranging from Finland, the Baltic States, Poland/Slovakia/Hungary, Northern Italy, Southern France to Spain. Regions in France, Western Germany, the Benelux countries and the UK have only small numbers of collaborating regions. Interestingly, the highest number of collaborating regions yield regions in Lithuania; Italy, Spain, Latvia and Malta (Figure 99). But there are also regions in almost all countries who have less than ten collaborating regions, some of them have even no collaborating partner region. Thus, the cooperation degree varies significantly within the countries, rather than betweem them.



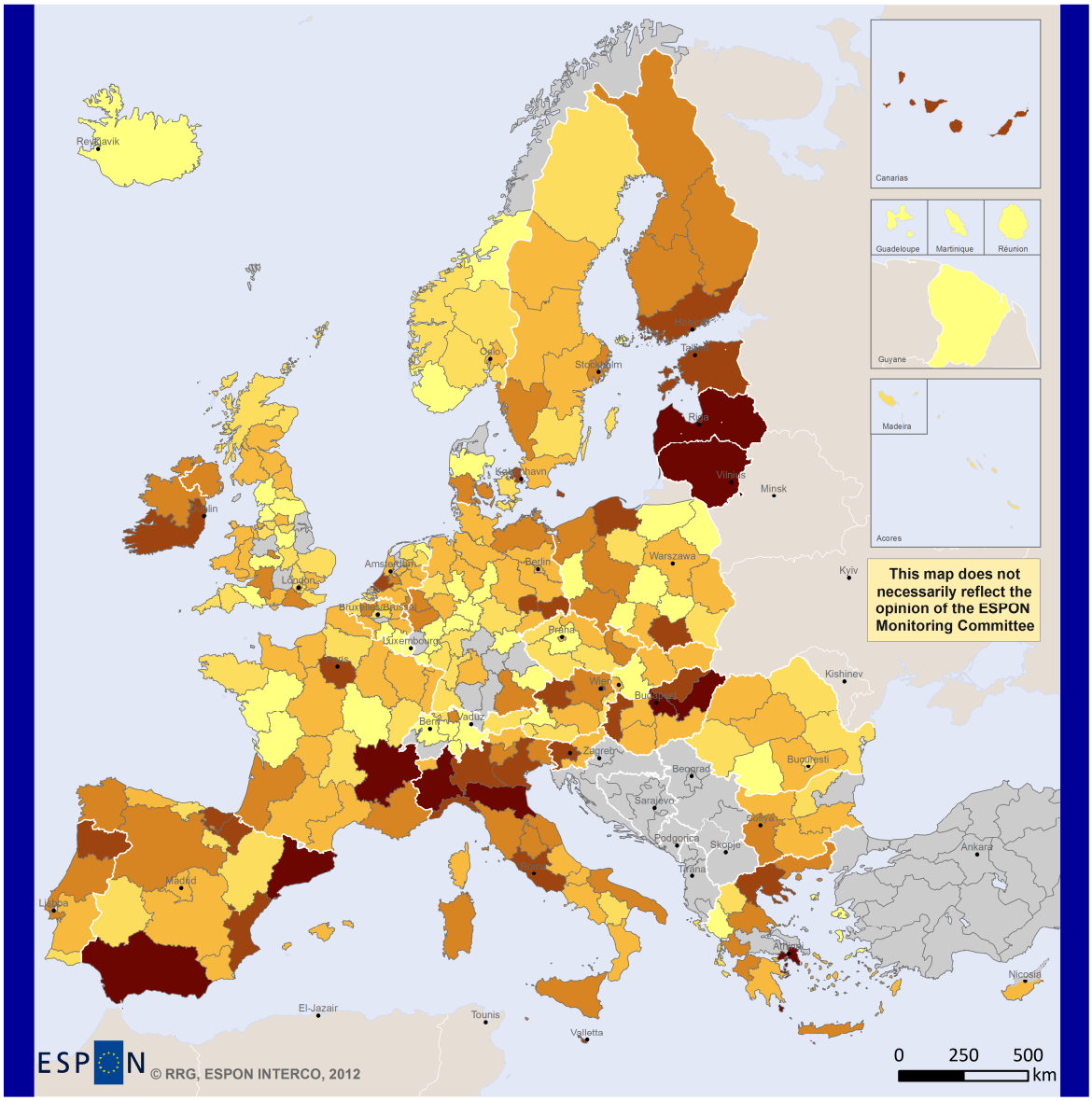
	AT	BE	BG	CH	CZ	DE	DK	EE	ES	FI	FR	GR	HU	IE	IS	IT	LT	LU	LV	MT	NL	NO	PL	PT	RO	SE	SI	SK	UK
Minimum	16	6	0	0	10	0	0	123	25	11	6	0	42	97	7	31	188	16	147	120	17	0	4	17	6	26	61	11	0
Mean	56	48	44	22	45	43	46	123	79	78	51	62	93	100	7	87	188	16	147	120	57	23	47	58	42	60	92	49	38
Maximum	111	104	78	77	76	119	101	123	173	120	127	129	144	103	7	175	188	16	147	120	105	46	115	117	66	93	123	67	90

Figure 99. Cooperation degree by country – minimum, mean and maximum.

Cooperation degree (2008)

0 9 0 1 c o o p d e g r 2 0 0 8 n 2 m e t

Territorial objective	*Change direction*	*Gaps*	*Years available*
Integrated polycentric territorial development	Minimum level desired; increase for regions with low intensities	Missing data: LI, MK, TR, Western Balkans, regions in various countries	2008



Degree (number of collaborating regions)

- 3 - 20
- 21 - 40
- 41 - 70
- 71 - 100
- 101 - 125
- 126 - 188
- No data

Indicator definition

Number of collaborating regions in INTERREG IIIC projects

Sigma convergence

Figure 100. Indicator – Cooperation degree (ESPON TERCO)

Summary

What are the territorial disparities of the indicators selected for the territorial objective of integrated polycentric territorial development?

The indicator population potential clearly highlights the main dichotomy between the European core area ('blue banana') and the peripheral ones. In areas outside the European core area only selected urban regions show above-average population potentials, while the other regions perform significantly below European average. A change in these patterns is unlikely to occur in the short run, even though some of the peripheral regions, such as regions in Spain, Greece or Ireland, experienced considerable population gains through migration processes. But since the main economic centers in Europe also experiences positive net migrations, it is rather unlikely that areas outside the blue banana significantly catch up. Nevertheless, the net migration patterns again highlight the tremendous negative population trends in the new Member States, in the Nordic countries, in Eastern Germany and Northern France, which need to be paid attention by policy makers.

Smaller countries like the Baltic States, Slovakia, or Slovenia already engaged over proportionally in international cooperation projects – by that trying to gain (or at least keep) knowledge in the countries as an instrument counteracting even further negative demographic trends.

C.3.7. Further ideas for analyses

The INTERCO TC top indicators allow us to better approach actual weaknesses (and strengths) of European territories in relation to the TA 2020 policy priorities and Europe 2020 priorities and targets.

From this scope, we present in next some examples of potential exploitations of INTERCO top indicators which are relatively easy to understand and to be used by regional and local level stakeholders[9]. These ideas are not included in the previous sections of the report dealing with the more usual exploitation of indicators.

The following "further ideas" attempt mainly take into account more deeply either the type of territories or the "autocorrelation" (spatial interaction) of territories.

(1) Interrelating the different aspects of TC through indicators

As it has been demonstrated previously, TC is a multidimensional concept and should be approached as such in both territorial analysis and territorial policy definition. From this scope, it is very important to study the interrelations among different issues of TC using appropriate indicators. For instance, it is very useful to see if comparatively high rates for specific regions for the tertiary educated people (TED), which are supposed to be reflecting a human potential of high quality, correspond or not to law rates of unemployment in the same regions.

[9] In section C.3.7 are used some of the analyses presented in the NTUA team working paper: "Contribution on the selection and further exploitation of Territorial Cohesion indicators" submitted to the LP on 19.10.2011.

We present in next this specific example. Evidently, many other interesting interrelations could be explored through appropriate indicators.

In order to compare correctly the unemployment rates to the TED rates per region, we had to build appropriate clusters of values for the two indicators corresponding to different types of regions. We started by normalising the values of the indicators by taking into account the population of the regions and putting the values in a common scale 0 to 1. As in the case of the unemployment a low rate has a positive meaning, we have calculated the differences of the respective values from 1 (see for this kind of normalisation for the case of unemployment in: Grasland, Hamez 2005).

In a second step, we built clusters of the values of unemployment rates (same for the TED rates), using the K-means statistics. We have specifically divided the unemployment rate's normalised values in three clusters. Evidently, we could create more clusters (for instance: 5 or 6). We have proceeded in such tests. However, as one should define a compromise among the distinction degree of the analysis (number of clusters) and the clarity of the result, we have decided to present here a Figure of the analysis using 3 clusters of unemployment rates (low, medium and high) and 3 clusters of TED rates (low, medium and high).

The method to build clusters of a range of values using K-means presents some advantages in comparison with simpler classifications of values by "manually" selected breaks (i.e. 0 / 0,33 / 0,66 / 1) or by "natural" breaks. The K-means method creates, where possible and after a number of iterations, compact clusters, as it ensures the minimization of the distance of each member of the cluster from the centroid of the cluster[10].

Next, we compared the 3 x 3 clusters and produced nine types (clusters) of regions: with high TED-low unemployment, high TED-medium unemployment, and so on (see in the Figure 101). In general lines, regions with high TED are situated in the European (ESPON space) north and west while regions with low TED are located in south and east. Evidently, there are notable exceptions, e.g. the northern Spain and the capital regions of a great number of southern and eastern countries with high TED. The territorial division of the ESPON space as for the unemployment rate has already been presented in previous sections of the Report. It differs considerably from the division regarding TED.

The synthesis of the two, which is shown in the Figure 101, enables us to compare the performance of the regions as for the TED in relation to their performance as for the unemployment. As a high TED is supposed to be related with a highly qualitative human capital and thus to low unemployment[11], it is "expected" that a region with high TED has low unemployment, whereas it is expected that a region with low TED has high unemployment and, finally, it is expected that a region with medium TED

[10] We have used, in this example, the K-means classification method of SPSS.

[11] It is usually supposed that a highly qualitative human capital contributes to the increase of GDP and it is also usually supposed that a high GDP is related to low unemployment rate. Evidently, all these are general hypotheses to be checked by the comparison of the two respective indicators per region.

has medium unemployment. From this scope, the Figure enables us to distinguish the regions with high TED-low unemployment ("good performance" for the two indicators, the performance as for the unemployment being "expected" from the performance as for the TED) e.g. south-eastern UK, western Norway, Brussels and Amsterdam regions but also Warsaw and Sofia regions, from those of high TED-high unemployment ("bad performance" for unemployment, the performance as for the latter being "not expected" from the performance as for the TED) such as northern Spain and Eastern Finland. Many other interesting contrasts could be detected regarding for instance the regions with low TED-high unemployment ("bad performance" for the two indicators, the performance as for the unemployment being "expected" from the performance as for the TED) which are more often found in south and east regions contrasting with regions presenting low TED and low unemployment ("good performance" for unemployment, the performance as for the latter being "not expected" from the performance as for the TED), e.g. northern Italy and northern Romania.

In a final step, we have compared the three clusters of unemployment rates with the three clusters of TED rates in order to better detect which regions present an unemployment rate higher than that "expected" from their TED rate –Figure 102. This Figure is similar to the previous one because the same clusters are used; it differs from the previous one only as for the way of presenting the phenomenon studied. However, it shows more clearly the regions presenting unemployment rate much higher than that expected from their TED rate. Thus, a clearer association of territories to a TC objective emerges: the human capital of these regions could be better used to decrease the high unemployment; this territorial observation could be an interesting space-based input for the implementation of the "human capital" policies at both the EU and national levels. Such regions are situated in South e.g. Spain and Southern France but also in Ireland, East Germany (EU "North"), the Baltic States and Finland –to note only some evident cases.

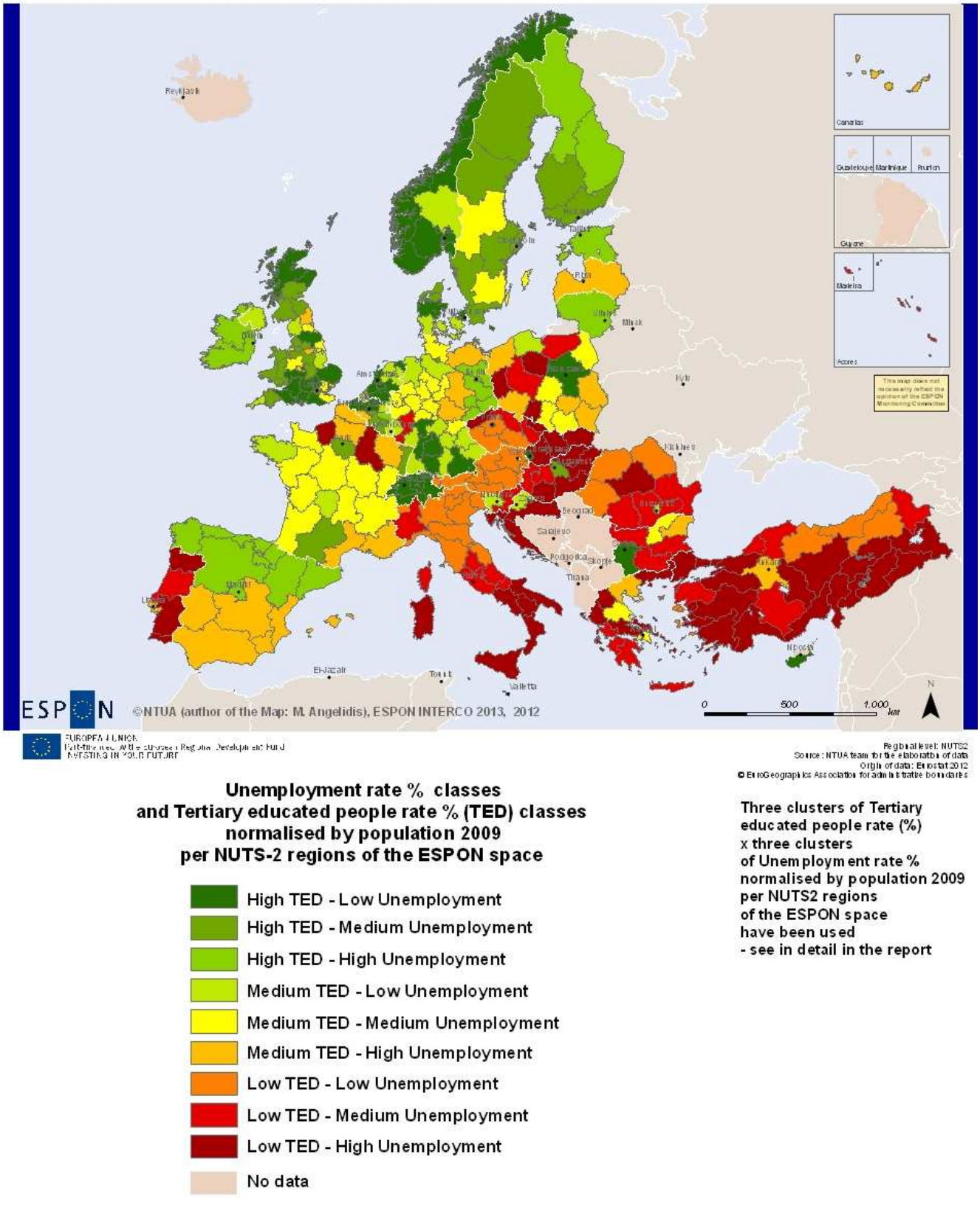


Figure 101. Typology of Unemployment and Tertiary educated people (TED) rates per NUTS 2 regions of the ESPON space 2009

Source of the data: Eurostat 2012, Elaboration of the data: NTUA team

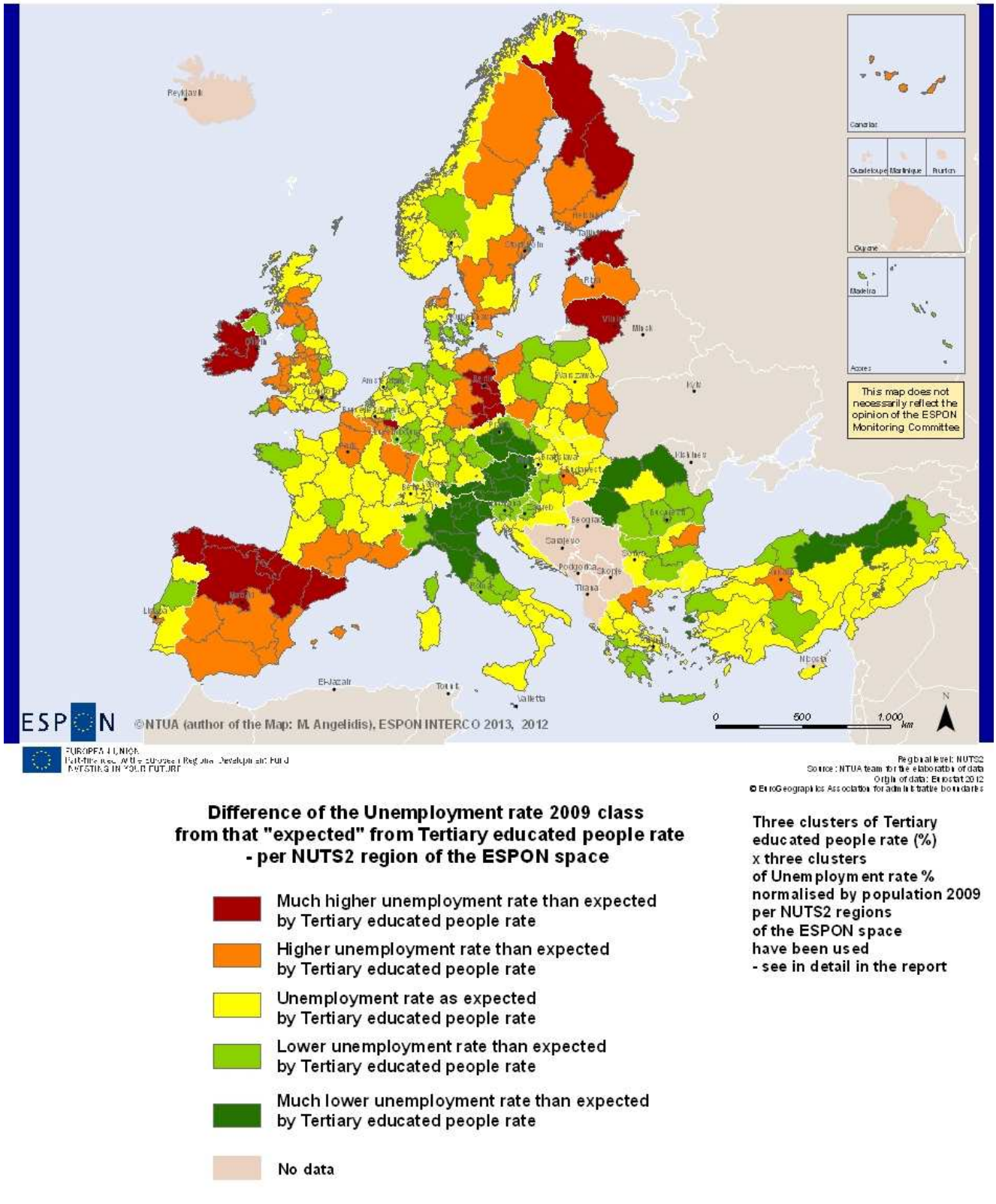


Figure 102. Difference of the Unemployment rates from that "expected" from the Tertiary educated people (TED) rates per NUTS 2 regions of the ESPON space 2009

Source of the data: Eurostat 2012, Elaboration of the data: NTUA team

(2) Going from the GDP to the well-being territorial indicators

As it is argued in INTERCO (on the basis of the most recent literature), well-being is better placed to express cohesion than GDP. Further on, well-being (and the respective indicators) is more "territorial" than GDP, as it is more embedded to the territories where the every-day life of citizens is deployed. Therefore, **GDP could be used as a kind of "wild card"** to be compared with indicators which better express well-being.

A second important reason is that GDP is very often used so far in Cohesion policy[12]. For instance, we could compare the regional distribution of GDP with that of unemployment. We can thus see which territories have higher unemployment rate than expected taking into account the spatial distribution of GDP. Therefore we could have a first configuration of the territories to which a more active policy of decrease of unemployment (creation of jobs) should be implemented.

We note that a first very interesting work on crossing GDP with unemployment has been done in Grasland, Hamez 2005. Recently (in September 2011) ESPON CU has made public in the ESPON website a similar map: "European Regions 2010: Economic Welfare and Unemployment". In the example that we present in the following we use a similar method. Our goal here is to present and comment in detail the method used and the potential use of the "crossing" for the integration of territorial cohesion objectives in EU and national/regional level policies.

Here we could first create typologies of EU regions for specific INTERCO indicators with cluster analysis and then compare the spatial distribution of each of these indicators with GDP. It is more appropriate to use for these statistical analyses data normalized by the population of the respective regions. As an example of the use of this kind of analysis we present in next the case of the indicator of unemployment rate 2007 (in %) in comparison with the GDP 2007 per NUTS 2 regions, both normalised by population. We present, specifically, an analysis using three clusters of unemployment rate: high, medium, low, in comparison with three clusters of GDP (normalised by population): high, medium, low.

The Figure 103 presents a simple crossing of the 3 unemployment classes with the 3 GDP classes. It is evident that there is an important number of NUTS 2 regions which have high unemployment rate while their GDP is high or medium. Inversely, there are numerous regions which have low unemployment rate while their GDP is low.

These differences, which are very important for the design of the territorial dimension of the Cohesion policy, are more clearly presented in the Figure 104 showing the difference between the unemployment rate observed and the unemployment rate *"expected" from the GDP rate* (of the respective regions)[13]. The above three x three clusters have been used.

It appears that a considerable number of regions belong to a much higher unemployment class than "expected" from the GDP class (of the same regions).

[12] See, among others, for this kind of reasoning in: Grasland, Hamez 2005.

[13] Both unemployment rate and GDP are normalised by population 2007 and refer to the NUTS 2 regions of the ESPON space.

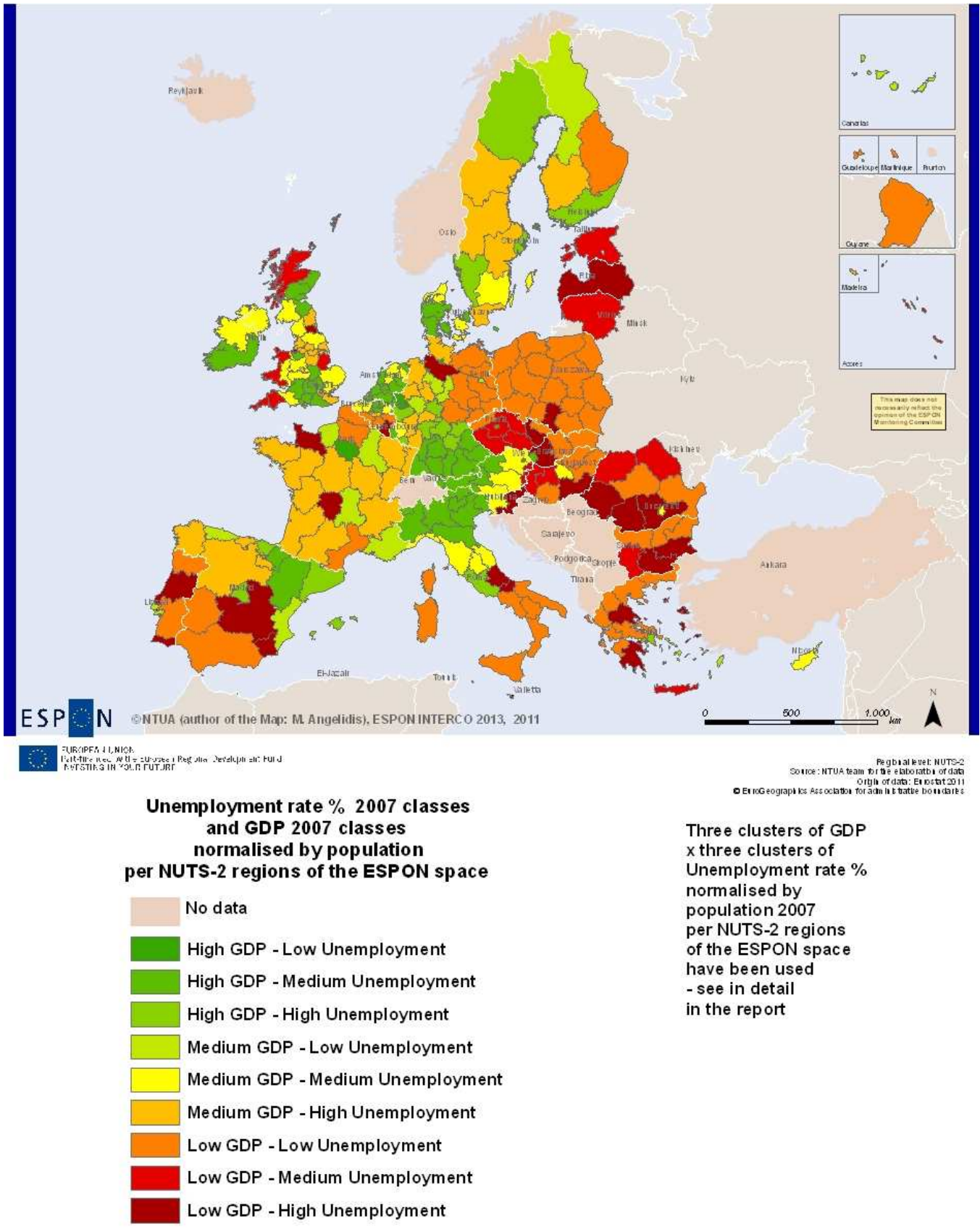


Figure 103. Unemployment rate (%) 2007 classes and GDP 2007 classes per NUTS 2 regions of the ESPON space

Source of the data: Eurostat 2011, Elaboration of the data: NTUA team

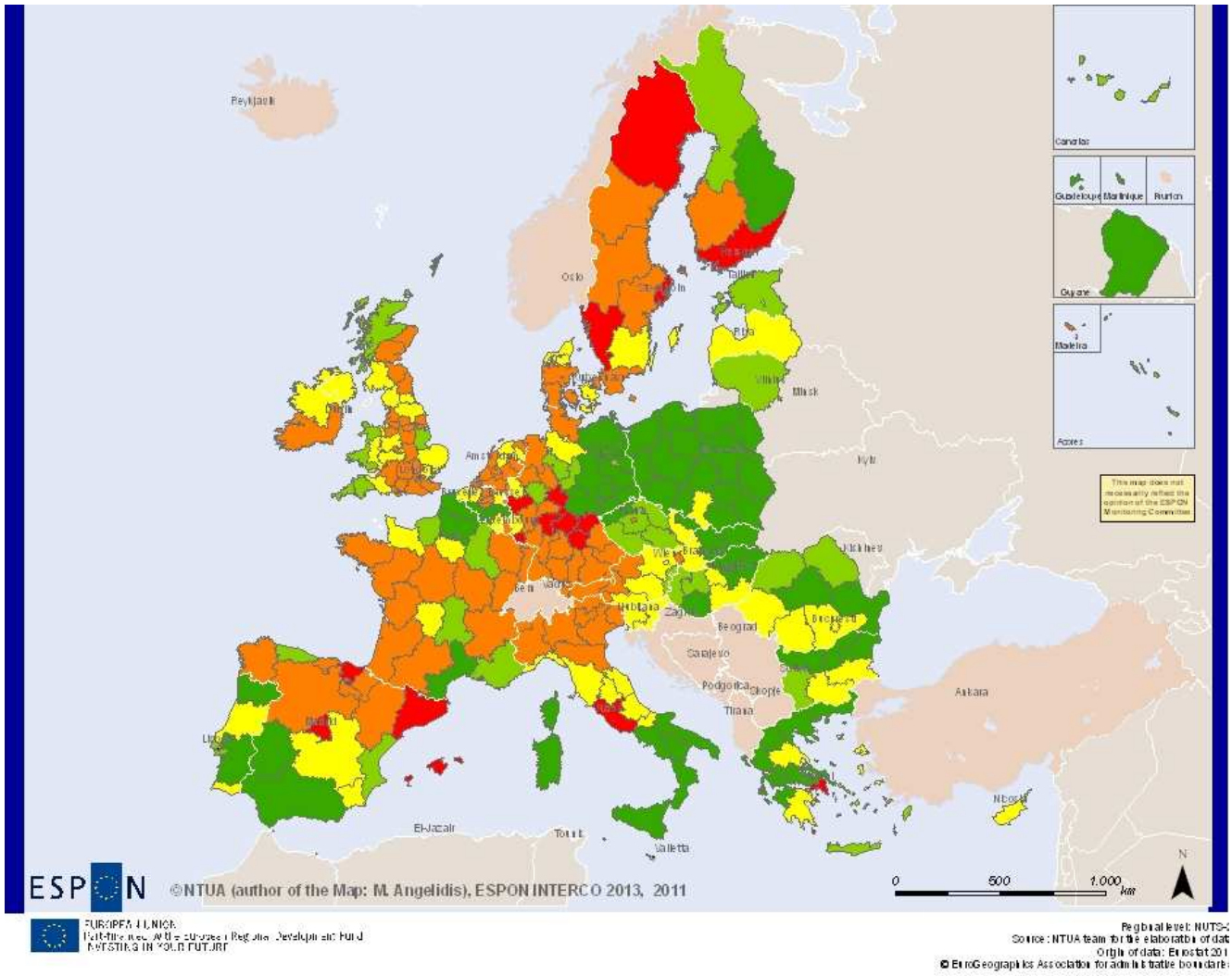


Figure 104. Unemployment rate (%) normalised by population 2007 per NUTS 2 regions of the ESPON space: relative difference to the unemployment rate "expected" from the GDP rate normalised by population

Source of the data: Eurostat 2011, Elaboration of the data: NTUA team

(4) Impacts of the territorial contiguity on territories' correlation (clustering) or dispersion

From this scope, the spatial autocorrelation method using the Moran's I index in association with Z-scores could be used.

Moran's I is a measure of spatial autocorrelation developed by Patrick A.P. Moran. Spatial autocorrelation is characterized by a correlation in a signal among nearby locations in space. Spatial autocorrelation is more complex than one-dimensional autocorrelation because spatial correlation is multi-dimensional (i.e. 2 or 3 dimensions of space) and multi-directional.

Moran's I is defined as :

$$I = \frac{\frac{\sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}}}{\sqrt{\sum_{i=1}^{n}\frac{(x_i - \bar{x})^2}{n}}\sqrt{\sum_{i=1}^{n}\frac{(x_i - \bar{x})^2}{n}}} = \frac{n}{\sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}} \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} c_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_{i=1}^{n}(x_i - \bar{x})^2}$$

where n is the number of spatial units indexed by i and j; x is the variable of interest; $\bar{x}$ is the mean of x; and c_{ij} is an element of a matrix of spatial weights.

The expected value of Moran's I under hypothesis of no spatial autocorrelation is: E (I) = -1/(n-1)

Negative (positive) values indicate negative (positive) spatial autocorrelation. Values range from −1 (indicating perfect dispersion) to +1 (perfect correlation). A zero value indicates a random spatial pattern. For statistical hypothesis testing, Moran's I values can be transformed to Z-scores in which values greater than 1.96 or smaller than −1.96 indicate spatial autocorrelation that is significant at the 5% level.

As an example of the use of this method, we present the case of the indicator of unemployment rate 2009 (%) per NUTS 2 regions[14] -see Figure 105.

Moran's I index = 0, 22 and Z-score = 12,12 standard deviations

This specific pattern is clustered (not dispersed). There is less than 1% likelihood that this clustered pattern could be the result of a random chance.

It is highly probable that in this case territorial contiguity impacts on territories' correlation (clustering) regarding unemployment rate.

In this case, it is more appropriate to use data normalized by the population of the respective regions. The result of the use of such data is presented in the Figure 106.

The degree of the impact of the territorial contiguity has not changed.

In the above two tests we have used for the parameter: "Conceptualisation of Spatial relationships"[15] the option: "Inverse distance" which takes into account for a specific NUTS 2 region the influence of other regions which are contiguous or not contiguous to this region.

We have then tested the option: "Polygons contiguity" so that the calculation takes into account only the contiguous (immediately neighbour) regions to each specific

[14] We have used the Spatial Statistics Tools of ESRI ArcGIS.

[15] In ESRI ArcGIS.

region. In this case the Moran's I index = 0,60 and Z-score = 14,61 standard deviations, which means that this kind of territorial contiguity impacts much more on territories' correlation (clustering) regarding unemployment rate.

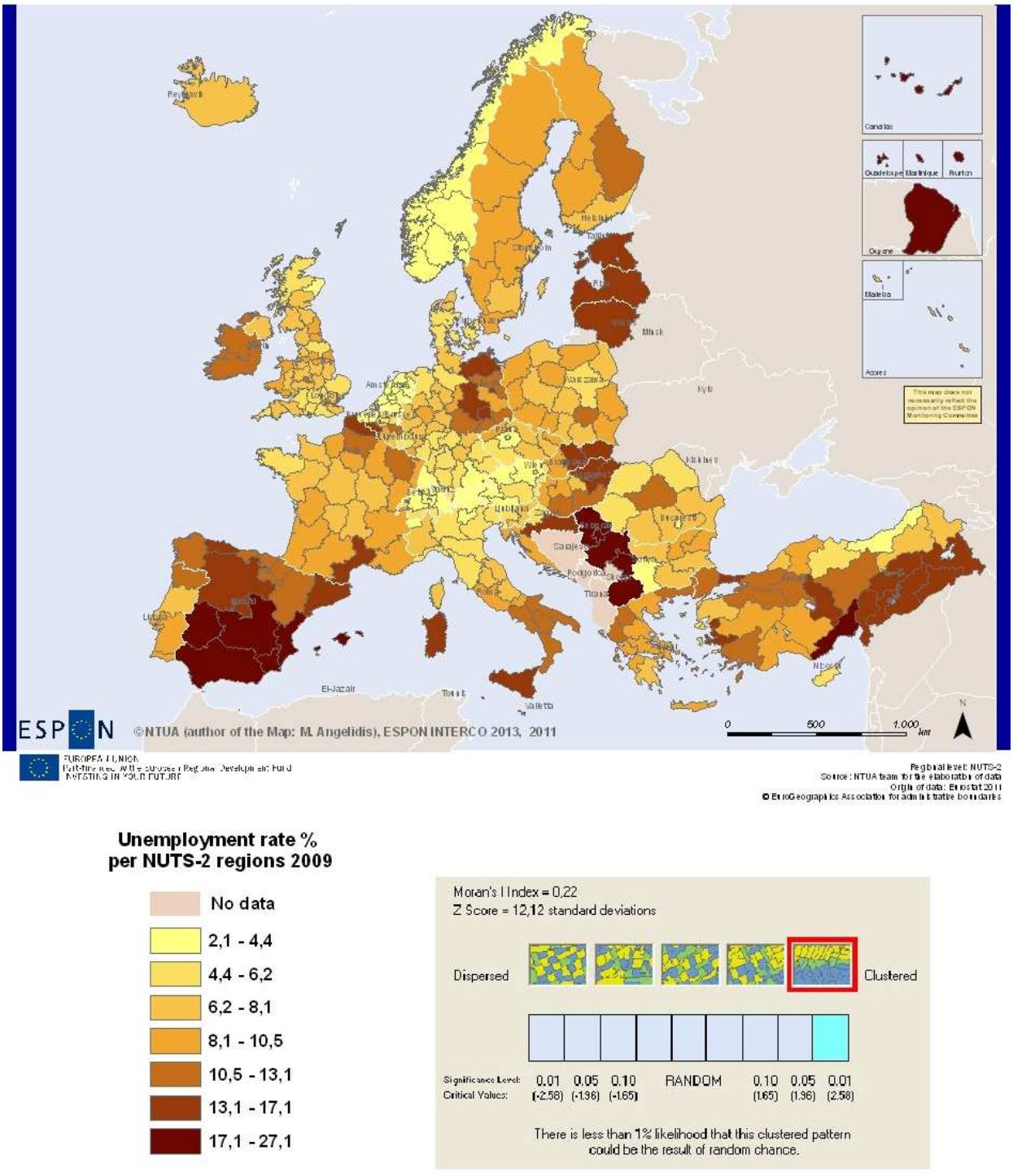


Figure 105: Unemployment rate (%) 2009 per NUTS 2 regions: Moran's I index and Z-score

Source of the data: Eurostat 2011, Elaboration of the data: NTUA team

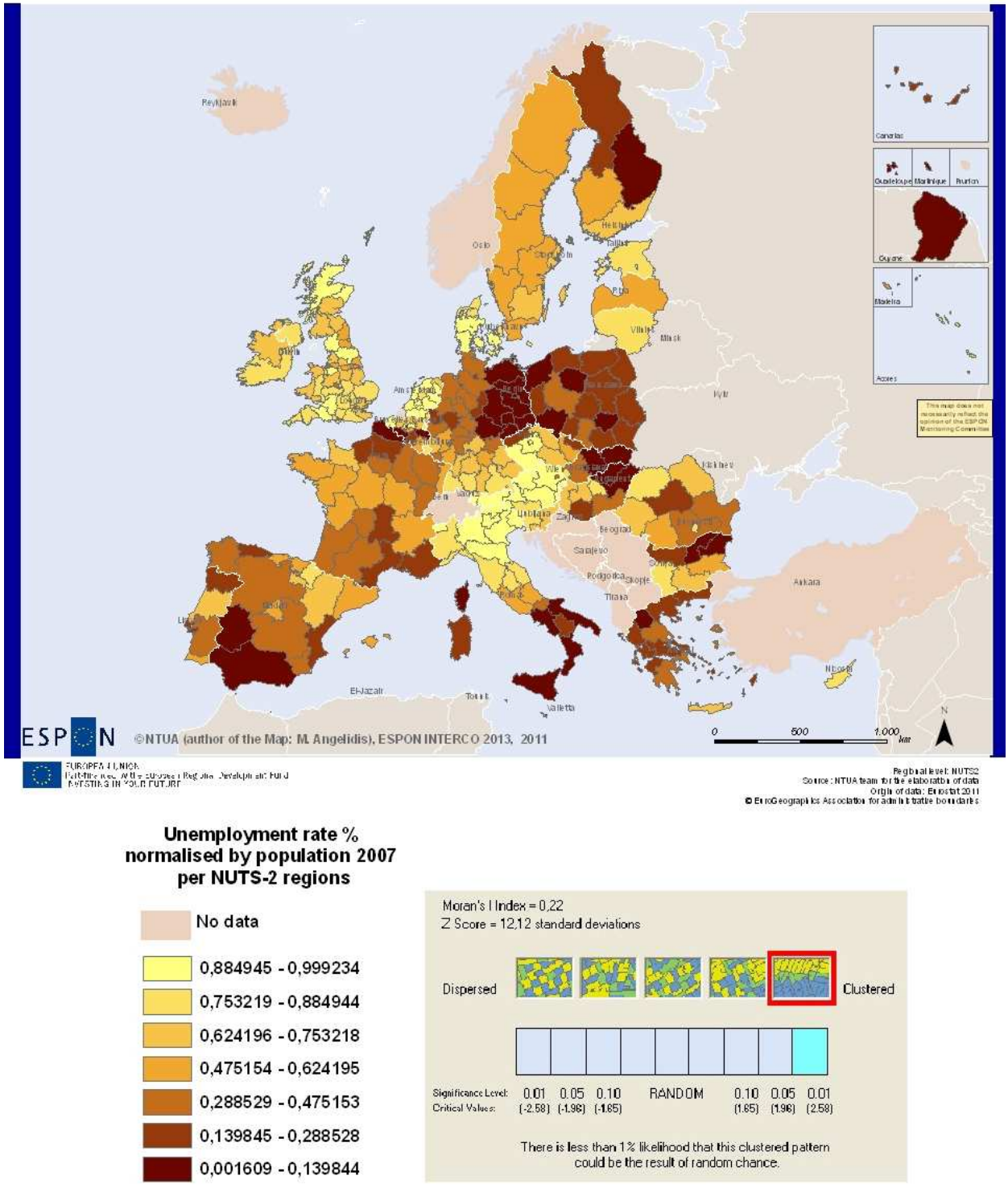


Figure 106. Unemployment rate (%) normalised by population 2007 per NUTS 2 regions: Moran's I index and Z-score

Source of the data: Eurostat 2011, Elaboration of the data: NTUA team

C.4. Other scales and territories

C.4.1. Territorial Cohesion: Extension to Global Level

The inclusion of the global scale is made to enhance our understanding of the processes occurring within Europe by framing them in broader, global perspective. The following discussion of the global level simply demonstrates first how global level indicators on (sustainable) development have implicitly informed some of the thinking on EU territorial cohesion indicators, and secondly the challenges of multiscalarity. Most of the global indicators are only available at NUTS 0, and thus lack an important dimension of territoriality that the EU-level indicators have.

While discussions are not (yet) focused on achieving the policy goal of territorial cohesion at the global level, there are several attempts to measure development, sustainable development and quality of life on a world-wide scale. The most pertinent and vigorous examples include the Human Development Index (HDI) to measure wealth, health and education and the World Development Indicators by the World Bank (World Bank, 2012) to help monitor the process towards the Millennium Development Goals which form a blueprint for achieving development world-wide, and in particular alleviating the situation of the most disadvantaged countries.

Globalisation, like territorial cohesion is a multifaceted notion but the principal underlying idea is the progressive integration of economies and societies according to the World Commission on the Social Dimension of Globalisation (WCSDG) (ILO, 2004). The WCSDG report identifies a number of elements where the EU model has contributed to success in improving living and working conditions: a strong legal framework; openness to the world economy and an effective market economy; supportive national social protection systems and common minimum standards for employment; involvement of the stakeholders through the European social dialogue; gender equality; and, more widely, respect for human rights and the rule of law, democracy and the strengthening of democratic supervision through the European Parliament. It also mentions that the EU's economic and social model, and the Lisbon Strategy even though they cannot simply be transposed to other parts of the world, contain a number of aspects which may be of interest for global development, especially in terms of the processes which are essential to the achievement of the balance between all the objectives at stake.

Comparing the INTERCO indicators for territorial cohesion in Europe clearly shows the added dimension that territoriality plays in territorial cohesion compared to social and economic cohesion, which are more easily understood at the non-European/global level. While Europe is surely a forerunner in advocating and developing territorial cohesion indicators at sub-national scale, there may be opportunities to “export” the territorial cohesion concept and policy goal to other parts of the world.

Extension to the global scale

From the outset, it may seem odd to take a global outlook of territorial cohesion. First of all, territorial cohesion, as a policy goal, is explicitly expressed mainly by the European Community, although its primary targets of efficient, equitable, sustainable and balanced development are also important global development priorities (such as the Millennium Development Goals). Second, there is a risk of sounding very Euro-centric in attempting to project the European territorial development paradigm outside its borders, but neither is this the specific aim of the project. In spite of this, we deem that it makes sense to use a global approach for investigating territorial cohesion on at least two accounts.

The first one relates to the acknowledgement that, even if 'territorial cohesion' is not mentioned explicitly, other international organisations have taken up similar stands on the future of territorial development policies (World Bank, annual). Consequently, not only can the European experiment of territorial cohesion can be useful in feeding in that process, but it also emphasizes the need to see the territorial cohesion processes within Europe as a link with other processes that occur in its close vicinity (neighbourhood), but also further away. Moreover, it seems that there is a certain momentum regarding new deals for territorial development policies in many countries outside the EU, for instance in the OECD (Yamazaki-Honda, 2005).

The second one relates to the nature of globalisation itself. The increase in interdependencies between states and regions worldwide implies that achieving territorial cohesion in Europe is only possible if one brings into the picture the necessary ways of mitigating and adapting to global processes connected to trade, demography, migration, climate change or energy consumption/production. In addition the global positioning of Europe as a whole on a global scale is important in this regard.

Global Development Goals and Measurements

One of the most simple composite global development measurements is the HDI, developed within the UNDP aegis (UNDP, 2011). The Human Development Index portents to measure basic quality of life through three parameters: wealth, health and education. In the latest HDI publication, all of the countries within the ESPON space ranked in the category "very high human development" with the exception of Romania, Bulgaria, Serbia and Turkey which ranked in the next highest category of the four categories. The Human Sustainable Development Index from 2010 re-ranked the traditional HDI by adding the indicator of carbon emissions to measure sustainability, and showed a different picture of development, whereby several industrialised countries such as the USA ranked much lower on the scale (UNU, 2010).

Agreed to by all world governments and leading development institutions at the UN in 2000, the Millennium Development Goals form a blueprint for achieving development world-wide, and in particular alleviating the situation of the most disadvantaged countries and ending poverty. These goals are meant to halve extreme poverty by

2013 and include a variety of indicators within eight main targets: 1) eradicating poverty and hunger, 2) achieving universal primary education, 3) promoting gender equality and empowering women, 4) reducing child mortality, 5) improving maternal health, 6) combating HIV/AIDS, malaria and other diseases, 7) ensuring environmental sustainability and 8) developing a global partnership for development.

The World Development Indicators, maintained by the World Bank and published yearly as a report is a database based on reliable sources to help monitor the process towards the Millennium Development Goals including data from 209 countries (World Bank, 2012). Indicators are analysed in a large number of themes: Agriculture and rural development, Economic policy and external debt, Education, Energy and Mining, Financial Sector, Gender, Health, Infrastructure, Labour & Social Protection, Poverty, Private Sector, Public Sector, Science and Technology, Social Development, and Urban Development.

Measuring Territorial Cohesion at European Level

One starting point for understanding territorial cohesion on a global and European level is by acknowledging that it is about identifying inequalities and looking for support of lagging-behind regions in order to narrow disparities between different territories by a) focussing in regional potentials and territorial capital; b) better positioning Europe and its regions (connectivity and integration) and c) promoting coherence of policies (TSP, 2005).

If territorial cohesion can be perceived as a multifaceted notion, globalisation is as well a term that is used in many ways, but the principal underlying idea is the progressive integration of economies and societies according to the WCSDG report (ILO, 2004). It is driven by new technologies, new economic relationships and the national and international policies of a wide range of actors, including governments, international organisations, business, media, labour and civil society.

The report of the WCSDG identifies a number of elements of the EU model as having contributed particularly to its success in improving living and working conditions: a strong legal framework; openness to the world economy and an effective market economy; supportive national social protection systems and common minimum standards for employment; involvement of the stakeholders through the European social dialogue; gender equality; and, more widely, respect for human rights and the rule of law, democracy and the strengthening of democratic supervision through the European Parliament.

It also mentions that the EU's economic and social model, and the Lisbon Strategy even though they cannot simply be transposed to other parts of the world, contain a number of aspects which may be of interest, especially in terms of the processes which are essential to the achievement of the balance between all the objectives at stake. A report of the European Commission issued in 2004 emphasised how the EU model places particular emphasis on solid institutional structures for the management of economic, social and environmental issues and the interplay between them, on effective public services and services of general interest, on strong social and civil

dialogue, on investment in human capital and on the quality of employment (EC, 2004).

It is worth mentioning as well the key findings of the ESPON 2013 Programme gathered in the First Synthesis Report (2010) that underlines potentially positive contributions to economic recovery and the Europe 2020 Strategy as well as to Territorial Cohesion and a balanced and polycentric Europe:

- Europe's position in the world is changing (having challenges in ageing labour force, demographic change, energy supply and demand, and the possible impacts of climate change)
- Europe's competitiveness depends greatly on its global cities and metropolitan regions, where enterprises can benefit from agglomeration economies and networks linking global market places.
- Connectivity is important. Liveable and smart places have good connections and an attractive environment. Metropolitan regions need good accessibility to each other and to global markets. The number and quality of connections to hubs and urban centres are important preconditions for efficient functional integration of all parts of the EU.
- Europe has many smart rural regions that are well connected to the global economy, accessible to urban centres and have turned local assets into development opportunities.
- Accessibility of regions and cities is increasing through infrastructure investments which benefit the economic competitiveness of these places.
- Vulnerability to climate change impacts is a concern especially in regions where adaptation and mitigation strategies are not sufficiently in place or effectively enforced.
- Good governance and territorial co-operation are vital at every geographical scale, including partnerships at the level of city-regions and larger macro-regions, as well as across policy sectors.

The Problem of Multiscalarity

An important aspect to have in mind when approaching territorial cohesion at several scales is the element of 'multiscalarity' which refers to the fact that the degree of cohesion can fluctuate according to the scale it is applied. Territorial cohesion examined at different territorial levels presents main different pictures of what cohesion actually means. Looking at territorial cohesion through an EU-level lens, for instance, will give a panoramic view of processes such as polycentric development, cores and peripheries and macro-level disparities, but narrowing the focus with a local level lens will portray a greater detail disparities and development gaps (Van Well, 2011). Thus, spatial disparities at for example the national level may be masked if the analysis is up-scaled to the EU or global level or down-scaled to regional or local levels (Davoudi, 2007).

As an example Davoudi mentions how the pursuit of polycentricity at the EU level has led to monocentrism at national level, represented by concentration of population and economic activity in capital cities or major urban centres. Another example is presented by Schön (Schön, 2005) when referring to socio-economic developments in which cohesion between the EU Member States increases while disparities between regions are constantly growing.

The multiscalar dimension of territorial cohesion is already present when looking at territorial development policies: the quest for territorial cohesion is framed between the inter-national (e.g. with policy initiatives taken by the EU or the World Bank) and the multi-national (e.g. with similar policy initiatives taken within many countries across the world).

One simple conclusion to the above is that the inclusion of the global scale in our work should feed a specific purpose, i.e. enhancing our understanding of the processes occurring within Europe by framing them in broader perspective.

An important standpoint from the outset is that "*geographical scales are social constructs that should not be reified"* (Taylor, 2008). Consequently, the global, understood as the territorial representation of the processes of "*stretching and deepening of social relations and institutions across space and time*" (Held, 2005), cannot be conceived as equivalent to worldwide, which is a static, both in space and time, territorial contour.

In his seminal work on globalisation, Taylor, which suggests adopting a three scale approach (urban, nation, global) to human geography, takes the angle of the global as 'the scale of reality', which derives from a materialist position centred on the world economy. He also claims that the global is the ultimate scale, the one that 'really matters' (Taylor, 1982).

Limitations for global indicators

We have discussed the difficulty to define what the global entails, especially in terms of thematic focus, geographical coverage and territorial level of investigation. The conceptual approach to the global (and the local) needs thus to be pragmatic and tailor-made. Yet, beyond the conceptual challenges, the empirical limitations may seem at least as overwhelming.

Indeed, the possibility to construct global indicators for territorial cohesion is strongly dependent on the availability of data for territories outside the Europe, which means that such data cannot be derived from the Eurostat office. Furthermore, there is no database that provides access to regional (i.e. NUTS 2 or 3) data on a worldwide basis, rather comparative analysis must be made at NUTS 0 (country) level.

Key themes at the global level, including those in global indicator sets, often put more focus on measuring levels of 'development' or 'sustainable development'. Territorial cohesion indicators in Europe still consider the economic aspects of 'smart growth' to be the defining indicator, even if the social, environmental and governance factors

are gaining in importance for achieving territorial cohesion, as we see from the broad storylines depicted in this report.

One of the reasons for this may be that social and environmental disparities are much greater at the global level than at the European level. In this vein, many of the global sustainability indicators show a degree of similarity among the countries at EU-level. For instance it is less meaningful to discuss indicators measuring infant mortality rates or literacy rates at only European scale, as the intra-European differences in terms of territorial cohesion are relatively small.

Relevance of European Territorial Cohesion Indicators and availability at Global Level

In general, many of the INTERCO indicators for territorial cohesion are also relevant for understanding patterns of development at global level, even if the global indicators are only available world-wide at NUTS 0 level. (See Annex 4. INTERCO Indicators at Global Level). All of the INTERCO top indicators within the set of *strong local economies ensuring global competitiveness* are available globally, although there are some important substitutions and proxies used, i.e. both the World Development Index and the Human Development Index no longer define wealth in terms of GDP per capita in PPP; rather, both of these indices have gone over to GNI per capita in PPP. The indicators for *innovative territories* are also highly relevant and mainly available in some form at the global level. However, most of the indicators that have more uniquely European territory characteristics, such as the accessibility indicators in the category *fair access to services, market and jobs* concerning accessibility to services and potential accessibility by road, rail and car are not directly available at global level. Rather there are related indicators for travel time to major cities. This does not mean that they are not relevant outside of Europe, but rather that they are measured in different forms than accessibility by territory, such as per capita within a larger spatial setting such as the entire country. Likewise the indicators for *attractive regions of high ecological values and strong territorial capital*, while highly relevant in a global setting, are generally systematically captured in other ways outside of the industrialised countries. The indicators measuring number and density of cooperation projects under the category *integrated polycentric territorial development* have no direct equivalents at the global level. As well, the indicator "population potential within 50 km" has no real equivalent at global level, population density rather stands in for this.

Comparing the INTERCO indicators for territorial cohesion in Europe clearly shows the added dimension that territoriality plays in territorial cohesion compared to social and economic cohesion, which are more easily understood at the non-European/global level. While Europe is surely a forerunner in advocating and developing territorial cohesion indicators at sub-national scale, there may be opportunities to "export" the territorial cohesion concept and policy goal to other parts of the world.

C.4.2. Territorial Cohesion: Extension to Local Level

General objectives

TC at local level can be analysed using the INTERCO top indicators; however, due to the scarcity of data at this level, it is worthwhile to explore local situations in the frame of INTERCO through case studies.

The analysis of the indicators for which there is available data (feasible indicators) is intended to show that an other kind of spatial inequalities is revealed when going beyond the traditional NUTS 3 level of study. Territories which seem to have certain level and/or certain type of spatial disparities in the traditional NUTS 3 level of analysis might register other types and/or other degrees of disparities at a local level. The idea is to observe if the analyses at LAU level bring important new insights regarding TC patterns at NUTS 3 level.

In line with what has been pointed out in the previous section for the world level, the local scale refer, according to some literature, to the “urban” or, according to other literature, to the finner urban-rural relationships, the finner divisions of specific regions as well as the intra-urban divisions.

Additionally to this, it is of interest to identify indicators for which there is available data in the local case-studies that do not actually exist at the EU regional level but that might be useful for the other levels in the framework of territorial cohesion.

Summarising, the main objective is to create awareness of the existence of another spatial layer/level of study additional (and complementary) to the traditional NUTS 2-3 scales, where more complex spatial patterns exist but seem to be imperceptible in the traditional way of displaying indicators on the basis of these regional scales.These patterns could provide very useful inputs for the implementation of the TC objectives at local as well as at higher levels.

It is important to say that the local level is not intended to substitute or compete with other scales of analysis, but rather is intended to open a dialogue between different scales that increasingly overlap temporally and spatially (Conti, Giaccaria, 2001).

The selection of case studies

According to INTERCO Inception and Interim Reports, criteria to define local case studies include the selection of relevant examples to the general theme of territorial coherence in countries where compilation of data is accessible and straightforward enough, like those countries covered by INTERCO TPG partners. This is due to the difficulties when finding data at LAU level. Later on, during INTERCO’s second TPG meeting, it was proposed to take as reference case studies developed in the framework of the ESPON DEMIFER project (Demographic and Migratory Flows Affecting European Regions and Cities, 2010) in which two of the PPs (NTUA & Nordregio) have participated.

With this in mind, the case studies selected to perform the analysis at the local level for ESPON INTERCO include Sydsverige-Eastern Denmark (Sweden-Denmark), Thessalia (Greece) and Piedmont (Italy).

Sydsverige-Eastern Denmark (Sweden and Denmark) is a case study with regions in two different countries, which has a long tradition of cross border cooperation and a mixed urban structure that includes a national capital city (Copenhagen, Denmark), one of the 3 major national metropolitan areas in Sweden (Malmö), regional centres, remote sparsely populated areas and islands.

Thessalia (Greece) on the other hand contains a number of small and medium sized cities outside the two national metropolitan regions of the country (Athens and Thessalonica) combined with rural and mountainous areas which represent a considerable extent of the case study.

Piedmont (Italy) is a border region with important contrasts between the east and west due to the existence of rural mountainous areas in contrast to one of Italy's largest business, industrial and economic centres.

The three case studies include NUTS 3 regions which cover satisfactorily the respective ranges of types for almost all the ESPON Territorial Typologies. Regarding the urban-rural typology by NUTS 3 region, among the case studies it is possible to find one predominantly urban region (in PI[16]), three intermediate regions close to a city (TH:1, SS:2), four predominantly rural regions close to a city (TH:1, PI:3) and four predominantly rural regions-remote (TH:2, SS:2).

Metropolitan regions are represented with three cases[17], while numerous coastal regions (6) are included in the three case study areas[18]. Five mountainous areas belong to the case studies[19] and, finally, the case studies include four regions with industrial branches loosing importance (SS:2, TH:1, PI:1).

[16] PI: Piedmont, TH: Thessalia, SS: Sydsverige-Eastern Denmark.

[17] Two big metropolitan regions in PI and SS and one medium sized in SS.

[18] From which, 4 (in SS) have a very high share of coastal population and 2 have a low share: 1 in PI and 1 in TH.

[19] Three areas are moderately mountainous remote (2 in TH and 1 in PI), one is predominantly mountainous under urban influence (TH), one is moderately mountainous under urban influence (TH) and one is predominantly mountainous remote (PI).

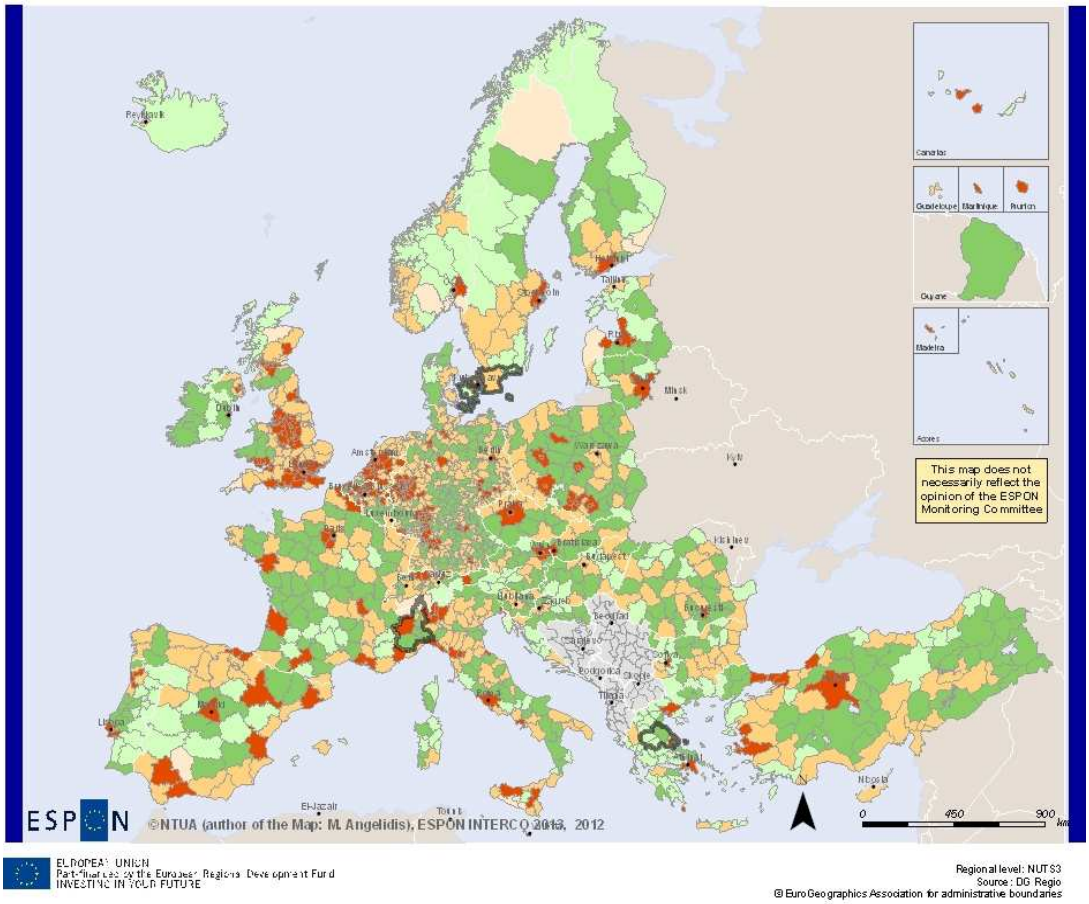


Figure 107. ESPON urban-rural typology by NUTS 3 regions and the three INTERCO case studies

The selection of INTERCO indicators

When it comes to the local scale, the analytical dimension is implemented by conducting 'zoomed-in' analysis. In concrete terms it comprises an analysis of disparities within a selection of three mentioned case studies. This required the compilation of data at LAU 1 or LAU 2 levels.

The analysis of territorial cohesion on the basis of the local level takes into consideration the indicators identified in the general framework of INTERCO. From this framework, indicators classified as top are those with the highest explanatory power and highest relevance for the issues and policies at stake. Top indicators are relevant as for their explanatory power also for the local scale but their feasibility at LAU levels is restricted and therefore their analysis depends pretty much on their availability at LAU level.

The lack of a standardised database like Eurostat for the LAU level makes the process of collection and harmonisation of data difficult at this level. Therefore the availability of the different indicators of the INTERCO project has been examined across several sources (National Statistical Institutions, National Employment Offices, Public National Health Institutions, local Statistical Offices, Ministries, etc., as well as the ESPON Database 2013 -FUAs database, GDP database, etc.). This exemplifies another difficulty when locating and collecting data at LAU level since often it is necessary to track indicators among several sources in each individual country/case study.

However it can be said that INTERCO top indicators on population, employment and education were feasible to be included in the analysis. Therefore, a set of selected, available, relevant local indicators in these topics is calculated for the specific case studies. The rest of indicators on health, energy, poverty, environment, quality of life and governance issues represent a challenge when trying to find data at LAU level and therefore could not be included in this analysis because of the lack of available or comprehensive data at LAU level. For the exact list of selected indicators per case study, please refer to each case study report (annexes 5, 6 and 7) where a summarising table indicates the set of selected and calculated local indicators respectively.

Sydsverige-Eastern Denmark

The case study area Sydsverige-Eastern Denmark is constituted by the cross border regions of Sydsverige in Sweden and Sjælland and Hovedstaden in Denmark. It covers both rural peripheral sparsely populated areas as well as important urban agglomerations such as Stor-Malmö (Greater Malmö) and Storkøbenhavn (Metropolitan Copenhagen) which together constitute one of the most densely populated areas in the Nordic Countries. It is a leader in promoting innovative research in several areas of technological development and is also home to the largest concentration of highly educated people in the Nordic countries. It hosts a well-developed working relationship between industry, higher education establishments and the authorities and is a major example of a region focused on

knowledge-base as one of the main pillars for regional development, having additionally optimal accessibility conditions and a strong history of cross border cooperation. Some of the key findings resulting from the analysis of this case study are described next.

The analysis at LAU level is able to visualise larger gaps between LAU units than between NUTS regions as the ranges of results at LAU level in all of the indicators selected were larger than the ones registered by NUTS 2 or 3 figures. Consequently all figures at a local level show larger coefficients of variation implying therefore a broader level of complexity of the indicators at a local level.

The analysis at LAU level displays important local disparities among the different parts of the case study area, distinguishing local areas around urban centres with well-structured knowledge economies in contrast with local areas in need of economic restructuring and regeneration, and some sparsely populated rural local areas located at a relative distance from main urban centres.

Figures at local level were also able to illustrate strong disparities inside single NUTS 3 regions depending on its settlement structure. A clear example here is the region Skåne, where high local disparities at LAU level were identified in terms of ageing indexes, distribution of population, education levels or unemployment patterns, due to the diverse structure of the region where the majority of population and urban areas are located in the west (along the coastline) in contrast to the majority of rural and sparsely populated LAUs located inland in the north or east.

The analysis at a local level also allowed us to identify that weak performing local areas are not exclusively restricted to peripheral or rural sparsely populated areas but on the contrary low performing local examples are also found in central regions around major urban centres along the Öresund Strait in the hinterlands of Copenhagen, Malmö-Lund or Helsingborg. Sometimes these areas are called “inner peripheries”. It was also found that average regional figures are unable to show exceptional local situations, for example remarkable LAUs with some of the highest shares of tertiary level educated population or critical LAU examples with some of the highest unemployment rates or ageing indexes. Other specific local situations as these ones can be found in the case study report which is included as an Annex.

Finally efforts developing indicators to measure crucial National and EU concepts at a local level (such as accessibility) were found in Skåne thanks to the Atlas on local accessibility. Also in Skåne and Blekinge an effort to measure business climate and entrepreneurship is found thanks to the Swedish Kommunranking which develops an index based on structural indicators at LAU level related to business and entrepreneurship as well as surveys to local entrepreneurs in every single municipality/LAU.

Piedmont

The case study area of Piedmont (NUTS 2 level) is situated in the north-western part of Italy. It includes four important cities and a wide number of urban LAUs (municipalities). Piedmont can be hardly be defined as a “monocentric” region. Many

of the capital cities of its eight NUTS 3 regions (provinces), as well as some other towns, maintain their economic importance that is often based on specific industrial activities or agricultural production although Piedmont is undoubtedly a region in "industrial transition". In this study we have decided to include only the Piedmont's NUTS 3 regions of Torino, Cuneo, Asti and Alessandria because this area enables us to analyse the inequalities among a big metropolitan region (Torino) and its periphery, among the urban NUTS 3 region of Torino and the three predominately rural NUTS 3 regions (Cuneo, Asti and Alessandria), as well as those among mountainous and lowland areas. The NUTS 3 region of Torino maintains a strong neo-industrial identity and plays the role of international gateway for Piedmont. The coastal area of Alessandria has a location on the borders with the Genoa area and a harbour which makes it particularly appropriate for logistic activities. The agricultural area of Asti and the mountainous one of Cuneo are dominated by the agro-industrial industry and their spatial organisation is based on a highly cohesive network of medium-sized cities. Some of the key findings resulting from the analysis of this case study are described next.

The analysis at LAU level (municipalities in this case) has shown larger gaps between LAU units than NUTS regions as all the ranges of results at LAU level for all of the feasible indicators used were larger than the ones registered by NUTS 3 figures. It is evident that there is a broader level of complexity of the indicators at local level; what is much more important is that the contrasts found at local level (LAU) correspond to crucial inequalities from a space based (territorial) point of view: among urban-rural areas, among different types of specific regions: mountainous-non mountainous, island-mainland areas, coastal areas, etc.[20], even more among different parts of urban zones: old industrial areas versus "new" service activities areas.

The ascertainment of this kind of local territorial inequalities could feed the implementation of more efficient TC policies at local level. For instance, as we will see in next, regarding the TC dimensions: competitiveness and inclusion as well as the territorial objectives: "strong local economies ensuring global competitiveness" and "inclusion and quality of life", different TC policies should be implemented in LAU aggregates presenting contrasting values of indicators (urban-rural, mountainous, island and so on).

Specifically, unemployment in the mountainous LAUs of Cuneo is lower than in the more urbanised ones of Torino and Alessandria. This was quite unexpected, because population ageing is higher in the mountainous LAUs which corresponds to a less dynamic population in comparison to the urban LAUs, close to the metropolitan areas, where population ageing is lower –showing a younger, more dynamic population -see Figure 108.

[20] ESPON territorial typologies start from the same scope but remain to the NUTS 3 level due to the scarce of data at LAU level.

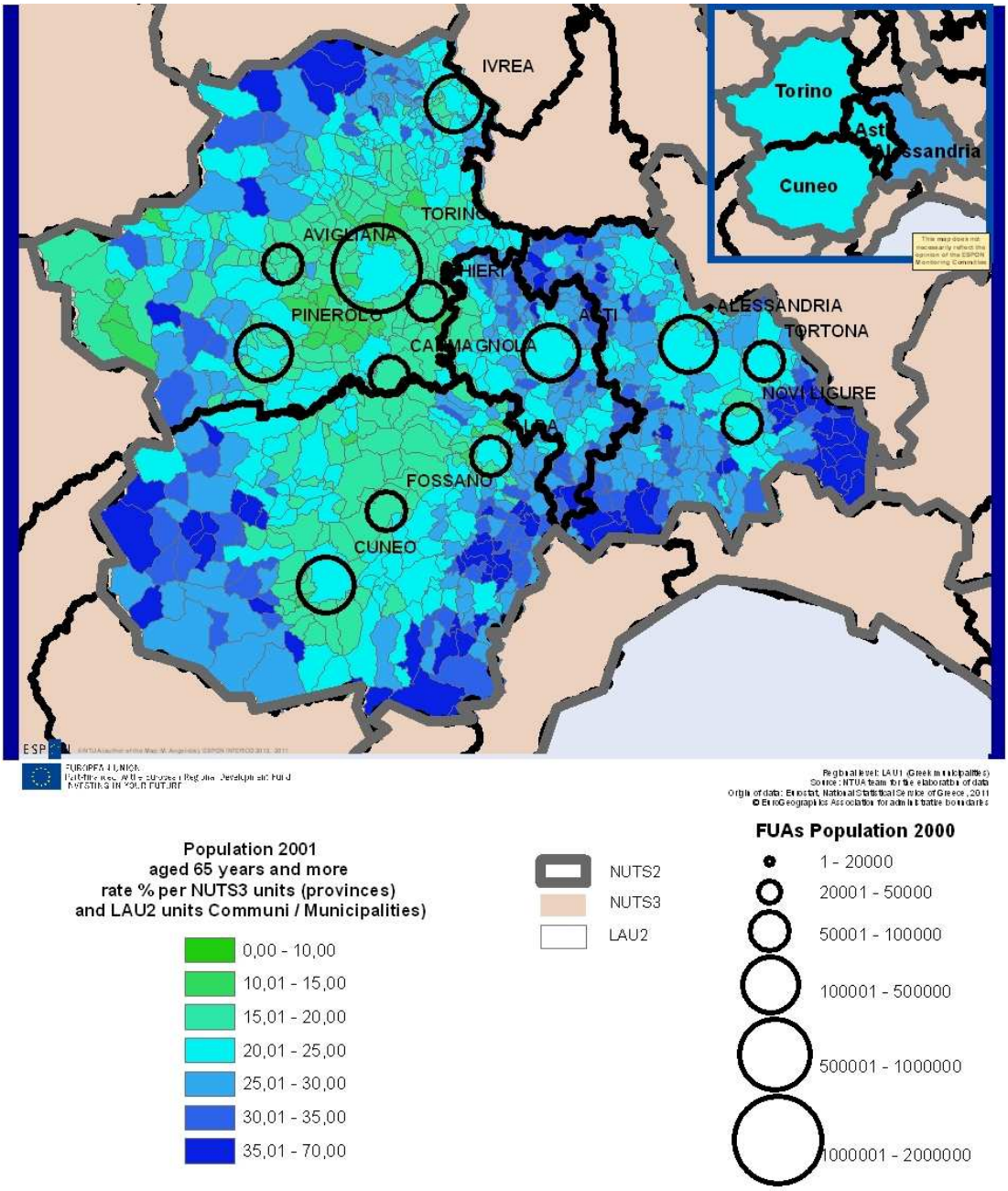


Figure 108. Piedmont: Ageing rate % (persons aged 65+ years / Total population) per NUTS 3 (provinces) and LAU 2 (comuni) 2001

Source of data: Eurostat and NSO of Italy, author: M. Angelidis

This pattern also applies to the population with tertiary education. Finally, the density of the population shows very large fluctuations among the mountainous LAUs -which present very low densities- and the LAUs near the big metropolitan city of Torino, which present much higher densities.

Figures at local level were also able to illustrate strong disparities inside single NUTS 3 regions. For instance, inside the big metropolitan region of Torino the peripheral areas show a totally different territorial pattern from the areas close to the city of Torino and perform differently in all the indicators tested (lower unemployment and

share of tertiary educated people, higher ageing rates and negative population change).

The analysis at a local level also allowed us to identify that local areas which perform weaker with regard to some important dimensions of territorial cohesion that are not exclusively restricted to rural sparsely populated areas but on the contrary are also found around major urban centres: for instance LAUs with high rate of population with tertiary education are not only found in the LAUs which include FUAs, but are also presented in some of the most distant areas in the region of Torino and some areas in the mountainous region of Cuneo. It was also found that average regional figures are unable to show exceptional local situations, as these ones can be found in the case study report which is included as an Annex.

Thessalia

The case study area of Thessalia (Greece) is a NUTS 2 region and corresponds to four NUTS 3 units. It includes two relatively large cities: Larissa and Volos, and two medium sized cities: Trikala and Karditsa. Volos is a centre of an intermediate region, close to a city while the three other cities are centres of predominantly rural areas, according to the ESPON urban-rural typology. While a large part of Thessalia is lowland, there are extensive mountainous areas as well as coastal areas and islands. The primary sector of the region while declining continues to be important at national level; the formerly considerably developed industry of the two bigger urban centres has strongly declined during the last thirty years, while the development of services and construction has partly compensated the losses of jobs in the region. Tourism continues to develop in the coastal area and even more in the islands of the region. All these trends are typical for the Greek regions and to a considerable extent to the southern regions of the ESPON space. Some of the key findings resulting from the analysis of this case study are described next.

As for the former two cases, the analysis at LAU level (municipalities in this case) has shown larger gaps between LAU units than NUTS regions as all the ranges of results at LAU level for all of the feasible indicators used were larger than the ones registered by NUTS 3 figures. It is evident that there is a broader level of complexity of the indicators at local level; what is much more important is that the contrasts found at local level correspond to crucial inequalities from space based (territorial) point of view –see in more detail in the Thessalia case study. As we have observed for this latter, the ascertainment of this kind of local territorial inequalities could feed the implementation of more efficient TC policies at local level. For instance, as we will see for Thessalia regarding the TC dimensions: competitiveness and inclusion, as well as the territorial objectives: “strong local economies ensuring global competitiveness” and “inclusion and quality of life”, different TC policies should be implemented in LAU aggregates presenting contrasting values of indicators (urban-rural, mountainous, island and so on).

In Thessalia, the analysis at LAU level displays important disparities in respect of all the ESPON territorial typologies (applying to the region) and all the indicators used: population with tertiary education, unemployment rate, employment rate 20-64,

disposable household income, population growth, ageing index and population density. Rural LAU population decreases strongly while the urban LAU one is stable or increase; the ageing and unemployment rates of the first are clearly higher and rise faster; its rate of tertiary educated people is clearly lower -see in Figure 109.

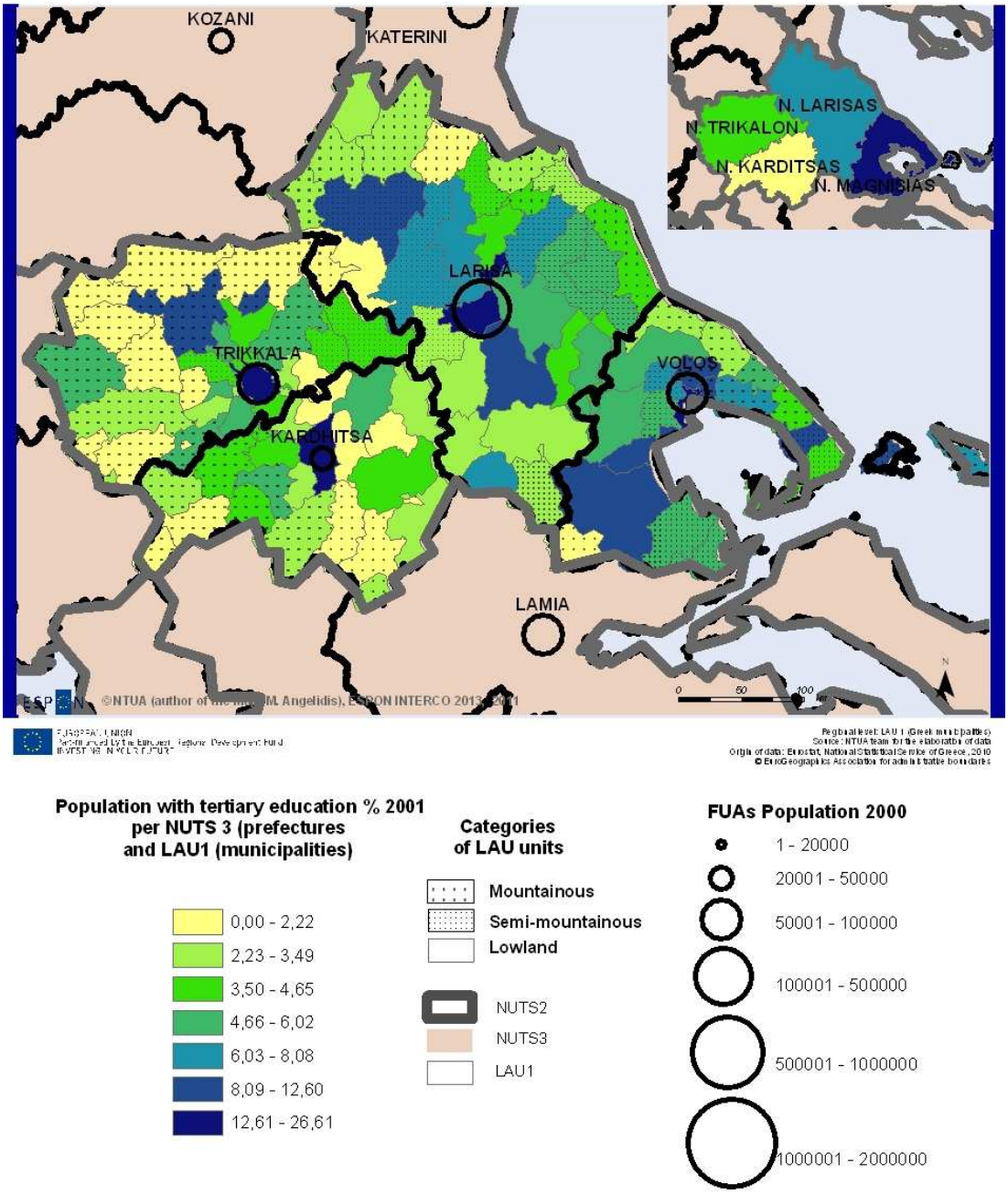


Figure 109. Thessalia region: Population with tertiary education in % 2001 in NUTS 3 (prefectures) and LAU 1 (municipalities): mountainous, semi-mountainous, lowland, Functional Urban Areas (FUAs) population 2001

Source of data: Greek Statistical Authority, author: M. Angelidis

Similar disparities are revealed when comparing the mountainous to the lowland population. It seems that the population of the coastal areas' and islands' LAUs – which are partly mountainous and rural– performs better than that of the respective comparable LAUs. Finally, the more intense industrial decline of the city of Volos explains to some extent its lower performance regarding population growth and structure.

Figures at local level were also able to illustrate strong disparities inside single NUTS 3 regions depending on its settlement structure. For instance, the economy of the western part of the NUTS 3 region of Trikala collapses because it is mountainous but also because it lacks small cities and the centre of the NUTS 3 region is relatively weak.

The analysis at a local level also allowed us to identify that local areas which performs weaker as for some important dimensions of territorial cohesion are not exclusively restricted to peripheral or rural sparsely populated areas but on the contrary are also found around major urban centres: for instance LAUs with very high unemployment rates are found in the immediate neighbouring areas of Larissa and Volos; the unemployment rate of these LAUs surpasses the respective rates for the mountainous and very sparsely populated LAUs of Thessalia. It was also found that average regional figures are unable to show exceptional local situations, as these ones can be found in the case study report (Annex 7).

It should also be stressed that datasets useful to measure crucial National and EU concepts at a local level in Thessalia, regarding for instance business development or tourism activities, are provided and regularly updated by NUTS 3 level Chambers.

Finally, the 3 case studies have demonstrated that "really territorial" aspects of cohesion could not be appropriately analysed using indicators at NUTS 3 level. Local indicators at LAU level could be very useful by complementing the latter analyses.

C.4.3. Western Balkans and Turkey

This work refers to:

d) the **Candidate Countries (CC)**: Croatia (HR), Former Yugoslav Republic of Macedonia - FYROM (MK), Montenegro (ME) and Turkey (TR) which have adopted the NUTS classification.

e) the **Potential Candidate Countries (PCC)**: Albania (AL), Bosnia & Herzegovina (BA), Serbia (RS) and Kosovo under UN Security Council Resolution 1244 (XK).

Objective of the research

A first objective of this research was to assess the availability and quality of data for the indicators which better reflect the territorial cohesion in the Western Balkans countries and Turkey. Thus, interested stakeholders could extend their territorial analyses in these countries, at least for the main facets of territorial cohesion. A second objective of the research was to analyse the territorial cohesion pattern in

these countries at different territorial levels: from the sub-European level to the national and, further down, to the sub-national level. This way, the work on this area, seen as a multi-level case study, enriches the entire multi-scalar approach of indicators developped by INTERCO.

We have implemented the following methodological steps -see in extent in the respective report in Annex 8 :

- we have examined the NUTS/LAU classification in the CC/PCC;
- next, we have commented the feasibility of the indicators of different kinds as for the data availability in the CC/PCC;
- then we have produced a general overview of the development of the CC/PCC in the European frame on the basis of existing literature and we have analysed the different TC dimensions at country (NUTS 0) and macro (overall CC/PCC) levels;
- next, we have used these indicators for the analysis of the territorial cohesion pattern in these countries at NUTS 2 level and NUTS 3 level, the latter being more territorial. This exercise enabled us to test the explanatory power of these indicators;
- finally, we have produced conclusions on the territorial cohesion in CC/PCC as well as on the effectiveness and the gaps of the methods of exploitation of indicators used. We have also proposed recommendations to interested stakeholders on the appropriate improvement of their work on territorial data on these countries.

NUTS/LAU classification in the CC/PCC

In the frame of the ESPON 2013 Database-1 project, in order to ensure a sound comparability of data of the PCC (which have not adopted the NUTS classification), the existing administrative units of these countries have been classified at different territorial levels in “similar NUTS” territorial units. For this purpose, the criterion of population potential of the EU NUTS classification has been used as well as the overall structure of government in these countries with focus on the power of the respective regional and local authorities and the main features of territorial development in each administrative level per country.

In the frame of INTERCO, we have checked the above classification and made necessary modifications and additions to the reasoning for the classification. To conclude, the “similar NUTS” divisions correspond almost fully with the respective divisions for the EU countries.

We present in the Figure 110 the overall division of the CC/PCC in NUTS 2-3 and similar NUTS 2-3 units.

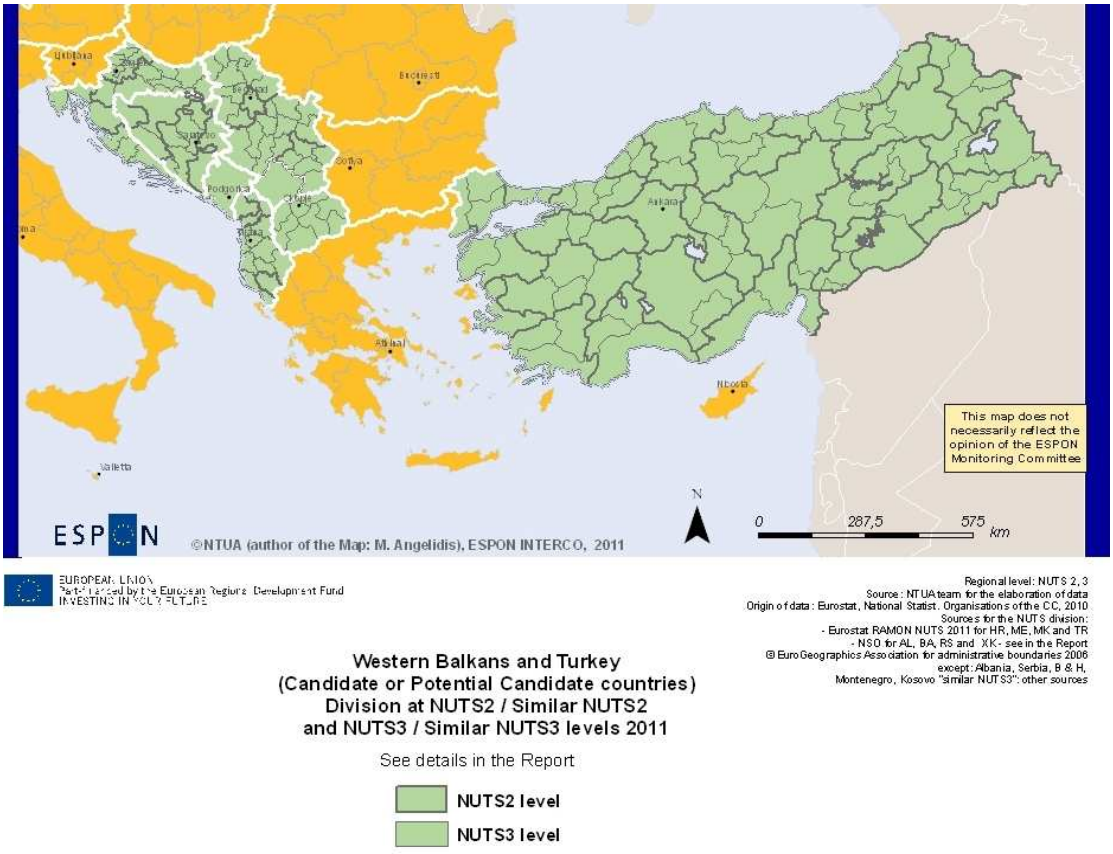


Figure 110. NUTS 2 and 3 units of the Western Balkans countries and Turkey (CC/PCC)

Feasibility of the INTERCO indicators as for the data availability in the CC/PCC

We should first remind that ESPON 2013 Database-1 project has, in general terms, referred only to a limited number of "basic" indicators for the CC/PCC. Following the scope of the entire INTERCO project, we have focused on a much larger range of indicators, including at first the top ones which are defined by the "selection of indicators" task of INTERCO[21]. Specifically, we have assessed the feasibility of the above indicators as for the availability and quality of relevant data. This assessment showed that there are available data at sub-national level (NUTS 2 or NUTS 3, which could be aggregated at national level) for seven top indicators, and for two others there is data only at national level.

Data sources: The data for HR, MK and TR are mostly from Eurostat, but data from National Statistical Organisations (NSO) and other sources have also been added. For ME and the PCC, Eurostat provides data only at NUTS 0 level –therefore, additional data should be used from the NSO and other sources. In general terms, for a number of indicators there are for the PCC only data at NUTS 0 level.

[21] We have also examined the feasibility of the "headline" and "core" indicators, defined in a previous phase of the project – see in the respective report in annex 8.

Cohesion trends at the macro level (overall CC/PCC) and the country level

The literature approach of the economic performance features of the CC/PCC provided us arguments on the existence of a TC pattern for the entire territory of CC/PCC (total of the countries) which is similar to the EU east one, but clearly less performing. Further on, the specific analysis of the different TC dimensions on the basis of indicators at country level have consolidated the above literature results, as for the majority of the TC dimensions. Inside the total area of the CC/PCC, TC inequalities per country are pronounced.

Regarding mainly competitiveness, HR and TR, which are candidates to join the EU, are equally performing with the two "weaker" EU east countries: Romania and Bulgaria. ME and RS perform less in economy than HR and TR and present also similar values regarding indicators of several other TC dimensions. MK, BA, AL and XK are even less developed and present a relative homogeneity regarding several TC dimensions.

Territorial cohesion at country and sub-national levels in the CC/PCC on the basis of feasible indicators (as for the data availability) – explanatory power of these indicators

As the necessary data at sub-national level for the PCC: AL, BA, RS and XK, are scarce, we have examined only six indicators: GDP rate, GDP dispersion, unemployment rate, ageing index, life expectancy at birth and population density. Therefore, we have not made a complete analysis of TC at this level. Inversely, we have analysed in more depth these few TC indicators in order to see if the additional results bring important insights regarding the TC patterns at national and sub-national levels (NUTS 2-3) as well as on the differences between these two last. This comparison complements the research of the project which refers to the entire ESPON space and to the local level.

We have specifically examined several types of indicators of variation (min/max, mean (average), standard deviation and coefficient of variation) at national and sub-national level, and examined how these statistics reflect the inequalities regarding TC. We concluded that the TC pattern of inequalities by dimension in the CC/PCC at national level differs considerably from that for the sub-national level. Specifically, the coefficients of variation (which is the more appropriate statistic for this issue) are clearly higher at NUTS 3 level, implying therefore a broader level of complexity of the indicators at this level.

These results are very similar with those found for the local case studies, which enables us to consolidate the conclusion that analyses at a higher than the NUTS 3 level could not bring "really territorial" results regarding cohesion.

C.5. GIS Data & Tools

This chapter briefly introduces the GIS implementation of the INTERCO database and the developed scripts and tools supporting work with the indicators. A comprehensive description of the INTERCO GIS Database and tools can be found in the database user manual.

C.5.1. Structure of the INTERCO Geodatabase

As the initial step for all further GIS activities in INTERCO, the overall INTERCO geodatabase has been established.

The INTERCO geodatabase is implemented in ESRI´s Personal Geodatabase format (PGDB) of ArcGIS Version 10.x, and is named **INTERCO_DB**. The overall geodatabase is structured by so-called feature datasets, feature classes and tables.

A *feature dataset* is a collection of related feature classes that share a common coordinate system. Feature datasets within a geodatabase are used to spatially or thematically organize and integrate related feature classes.

Feature classes are homogeneous collections of common features, each having the same spatial representation, such as points, lines or polygons, and a common set of attribute columns (fields). The four most commonly used feature classes in a geodatabase are points, lines, polygons and annotations.

The third building block of a geodatabase is tables. *Tables* store statistical data. The tables are not permanently linked to any feature class, but if a common field exist both a table and a feature class may be joined to each other. The join may be furthermore permanently saved in a so-called *relationship class*.

The **INTERCO_DB** PGDB comprises feature datasets, feature classes and standalone tables, as shown in Figure 111:

- The feature dataset called **ADMINISTRATIVE_BOUNDARIES** stores line and polygon layers representing administrative units. Most of these layers were imported from the overall ESPON Database; however, the layers called **ZONES_INTERCO*** represents the newly created INTERCO NUTS region layers.
- The feature dataset called **LANDCOVER** provides land cover and land use layers. Currently two layers are available, which are the **LAKES** layer, i.e. a layer representing water bodies derived from the seamless ESPON NUTS 5 municipality layer, and the **UMZ_PROJECT** layer, which represents settlements/urban areas, taken from the overall ESPON Database.
- The feature dataset called **OTHER_LAYERS** comprises various other layers that are needed for drawing maps or for GIS processing. All layers subsumed under this feature dataset were taken from the ESPON Database.
- Apart from these feature datasets, the **INTERCO_DB** PDGB provides a number of different standalone tables, which can be combined into three groups: first, the

template tables **ZONE_TEMPLATE_TABLE_NUTS3, ZONE_TEMPLATE_TABLE_NUTS2**, **ZONE_TEMPLATE_TABLE_NUTS1**, and **ZONE_TEMPLATE_TABLE_NUTS0** are template tables providing lists of all NUTS 3, 2, 1, and 0 regions that are used in INTERCO. These templates can be used to create new tables. Tables starting with **RD*** and followed by numeric numbers represent "raw data" tables, i.e. tables to provide raw data that are needed to calculate certain indicators but that are not indicators itself. Finally all standalone tables starting with **IC_*** store the actual indicators, where one table is supposed to store all indicators belonging to a particular category (**IC**) for a specific spatial level. The actual spatial level is provided as suffix to the table name (***_NUTS0**, ***_NUTS1, *_NUTS2**, or ***_NUTS3**). The following eleven indicator categories were identified:

- Agriculture and Fisheries
- Demography
- Transport, accessibility and communication
- Energy
- Land use
- Social and cultural affairs, quality of life
- Economy, labour force
- Environment quality, natural assets, hazards
- Governance
- Territorial structure
- Non & cross-thematic data

These categories correspond to the classification scheme (thesaurus) of the overall ESPON database, which later on allows a smooth integration of the INTERCO indicators into the ESPON database. Each category is further subdivided into sub-categories, which again were derived from the ESPON database categorisation. Table 10 illustrates the categories and sub-categories of the ESPON DB which are applied to set up the INTERCO GIS Database.

Cat. nr	Category name	Sub-cat. nr	Sub-category name
1	AGRICULTURE AND FISHERIES	1.01	Land Use
		1.02	Farms Structure
		1.03	Employment
		1.04	Livestock
		1.05	Production
2	DEMOGRAPHY	2.01	Population Structure
		2.02	Migration
		2.03	Total population
		2.04	Urban-rural population
3	TRANSPORT, ACCESSIBILITY, COMMUNICATION	3.01	Transport Infrastructure
		3.02	Passengers and Good Transport
		3.03	Accessibility
		3.04	Impacts of Transport Policies
		3.05	Information & Communication Technologies
4	ENERGY	4.01	Energy
5	LAND USE	5.01	Land Use
6	SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE	6.01	Households and dwellings
		6.02	Education
		6.03	Health
		6.04	Poverty
		6.05	Other social
		6.06	Culture
		6.07	Quality of life
7	ECONOMY, LABOUR FORCE	7.01	Labour force
		7.02	Employment, Unemployment
		7.03	Income and Consumption
		7.04	Investments, Finances, Expenditures
		7.05	Industry, Services
		7.06	Tourism
		7.07	Innovation
		7.08	Business, all sectors
8	ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS	8.01	Environment quality
		8.02	Natural assets
		8.03	Climate change
		8.04	Risks, hazards
9	GOVERNANCE	9.01	Governance
10	TERRITORIAL STRUCTURE	10.01	Urban structure
		10.02	Regional/Territorial structure
99	NON - CROSS-THEMATIC DATA	99.01	Integrative indices and typologies
		99.02	Geographical objects

Table 10. Categories and sub-categories of the ESPON DB

Furthermore, there will be one column per indicator in the **IC_*** tables. The column header corresponds to the unique INTERCO indicator code (see below).

- The metadata describing the **INTERCO_DB** PGDB will also be stored as part of the geodatabase (standard metadata functionalities of ArcGIS). From there they can be accessed or exported to **XML** file format, which itself can be read by Word or other word processors. The exported metadata in **XML** format can be accessed from outside ArcGIS via the **DOC** sub-directory (see folder description below). Metadata in ArcGIS will be stored following ISO 19139 metadata implementation specification.

A full description of this geodatabase, including detailed descriptions of database structures, fields and formats, will be given in the metadata document that will be provided through the database CD-ROM/DVD.

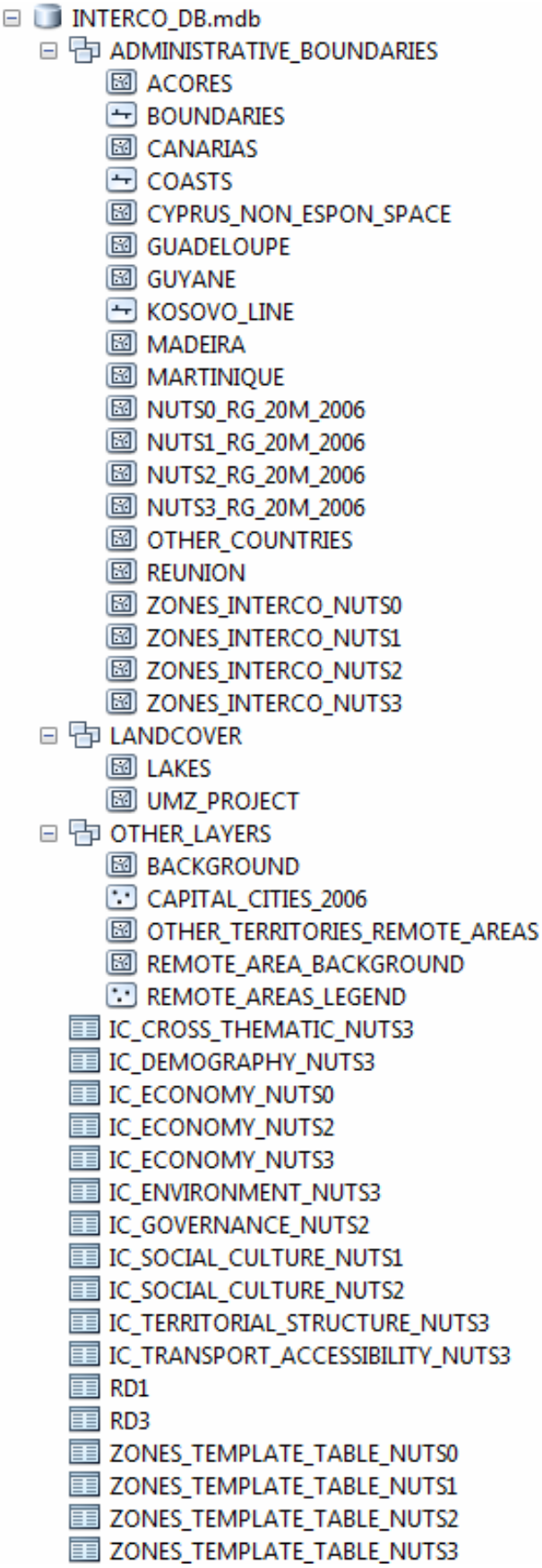


Figure 111. INTERCO_DB PGDB structure and contents (excerpts)

C.5.2. Scripts and Tools

In order to simplify working with the **INTERCO_DB** database, several scripts and tools have been developed. Tools comprise analysis tools, general database tools, export tools and indicator tools, all of them subsumed in a new INTERCO toolbox for ArcGIS, called **INTERCO Tools**.

Analysis tools enable simply statistical operations to quickly calculate summary statistics (minimum, mean, maximum, standard deviation, range, count) for selected indicators and years. *Database tools* allow to easily add new indicator tables based upon template lists, and to clean the database after major user operations. *Export tools* allow to quickly retrieve and export individual indicators or complete category tables from the PGDB to dbase or ASCII file formats. Finally a collection of *indicator tools* allow to update selected indicators in an easy manner.

The basic underlying development philosophy of these tools was to look at them from the user´s point of view, i.e. all tools are indicator-driver rathern than database driven. This means, when launching any of these tools the user needs to specify the name of the territorial cohesion indicator or the name of the territorial objective, rather than needs to specify the storage location. By that the user works with the tools problem-oriented rather than data oriented. The **INTERCO Tools** then take care at which location and in which table the selected indicators are stored.

The **INTERCO Tools** toolbox is subdivided by the four toolsets **Analysis**, **Database**, **Export** and **Indicators**, as mentioned before (Figure 112). Like any other tools under ArcGIS, they can easily be launched just by clicking the tool name. After launching any tool, the user has to enter some input before the script processes. All tools are written in Python. They require ArcGIS Version 10 including the Arcpy installation.

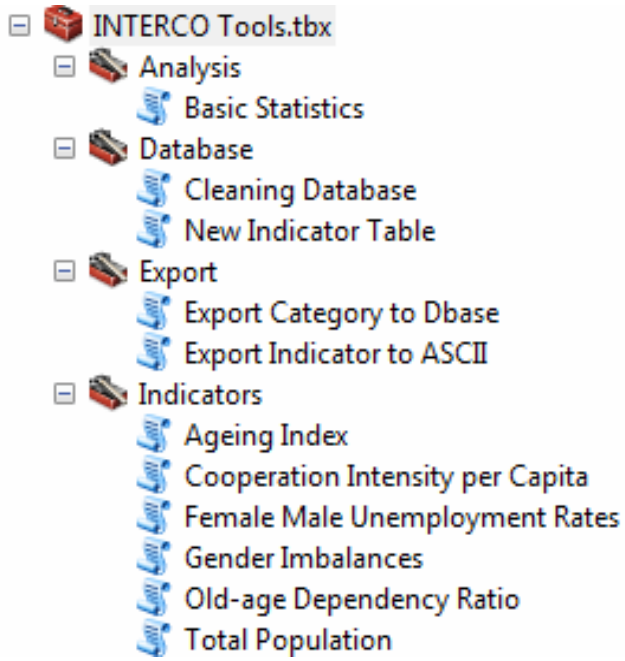


Figure 112. INTERCO tools in ArcGIS Toolbox

Altogether eleven tools were developed, of which six are dedicated to update and re-calculate cohesion indicators. These six indicators (ageing index, cooperation intensity per capita, difference in female-male unemployment rate, gender imbalances, old-age dependency ratio, total population) are usually not available in open statistics just as Eurostat, but need to be calculated based on raw input data such as population by sex or population by age groups. The six scripts then will perform these calculations based on the raw data. The other selected INTERCO indicators, however, are either directly taken 'as is' from data providers such as Eurostat, or have been modelled by other ESPON projects (like the accessibility indicators); in both cases there is no need to provide tools for re-calculation or update of these indicators.

A detailed description of the tools including their functionalities and graphical user interface is given in Annex 12, the Database User Manual.

While the tools (user interface) itself can be accessed through ArcCatalog from the **TOOLS** directory, the actual underlying Python scripts are stored as separate files in the same directory. The file suffix of the Python scripts is ***.py**. There is one file per INTERCO tool. Even though these scripting files can be opened with any text editor, it is recommended not to edit them to avoid affecting their functionalities. In order to ensure a proper functioning of the tools, one should neither delete the Python scripts nor move them to another location nor delete the **INTERCO Tools** toolbox (file extension ***.tbx**). Furthermore, the entire **TOOLS** directory may not be moved in relation to the location of the **INTERCO_DB** database.

C.5.3. Mapping and cartography

The mapping of the indicators and the cartographic layout will be based upon the mapkits developed by the ESPON 2013 Database project (Zanin et al., 2010). Among the four available mapkits, the ESPON Space mapkit was selected as the most suitable one for INTERCO. Even though, unlike the ESPON Space and Candidate Countries mapkit, the territory of Turkey is not fully covered by it, it was selected since it provides the most detailed insight (=highest resolution) for Europe as a whole which is important to analyse spatial disparities.

All European-wide maps will be produced by using this template. The template is stored as template file for ArcGIS (i.e. **MXT** and **MXD** files) in a specific folder (see below). The original **MXD** file provided by the ESPON 2013 Database project has been amended as follows to meet the INTERCO requirements (Figure 113):

(i) *Additional metadata*: above and below the map field, metadata information for the indicator in question was added, providing the reader with all necessary metadata information. The added metadata information refer to the indicator code (see chapter "C.5.4. Indicator coding system" below), territorial objectives, desired direction of change (change direction), data gaps, and general years

available (information above main map), as well as detailed indicator definition (added below the main map).

(ii) *Diagram*: while the main map area is used to show the territorial disparities at a given time, a diagram field was added below the map showing the sigma convergence or beta convergence graphs which analyse the spatio-temporal development of the indicator. By this, the map template shows both the territorial and temporal dimensions within one page.

(iii) *MXD file version*: all MXD files were created with ArcGIS Version 10.

The enhanced map template ensures that all necessary information is provided to the reader at one page; in particular both dimensions of territorial cohesion, i.e. the territorial disparities and the evolution over time, are presented at a glance.

The layers used in the maps will also be provided as so-called **LYR** files, i.e. specific files that store the layer symbology (colors, symbols, line width, line and polygon patterns, markers, etc.) for later uses in other maps, without the need to re-establish the overall symbology again. Figure 114 illustrates the **LYR** files that constitute the basic map layout (as shown in Figure 113), which are stored in the **LYRS** subdirectory (see below).

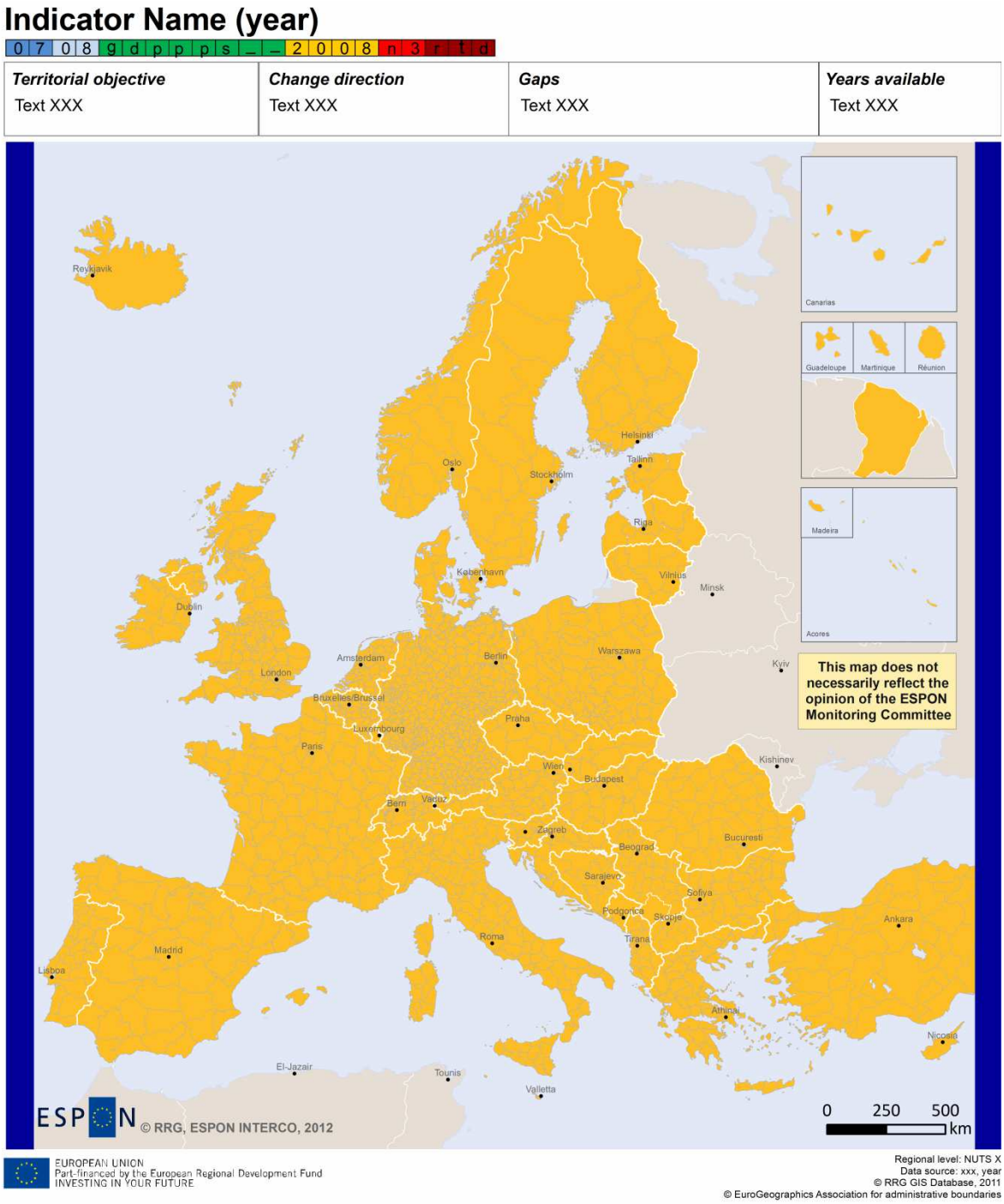


Figure 113. Enhanced INTERCO Map Template

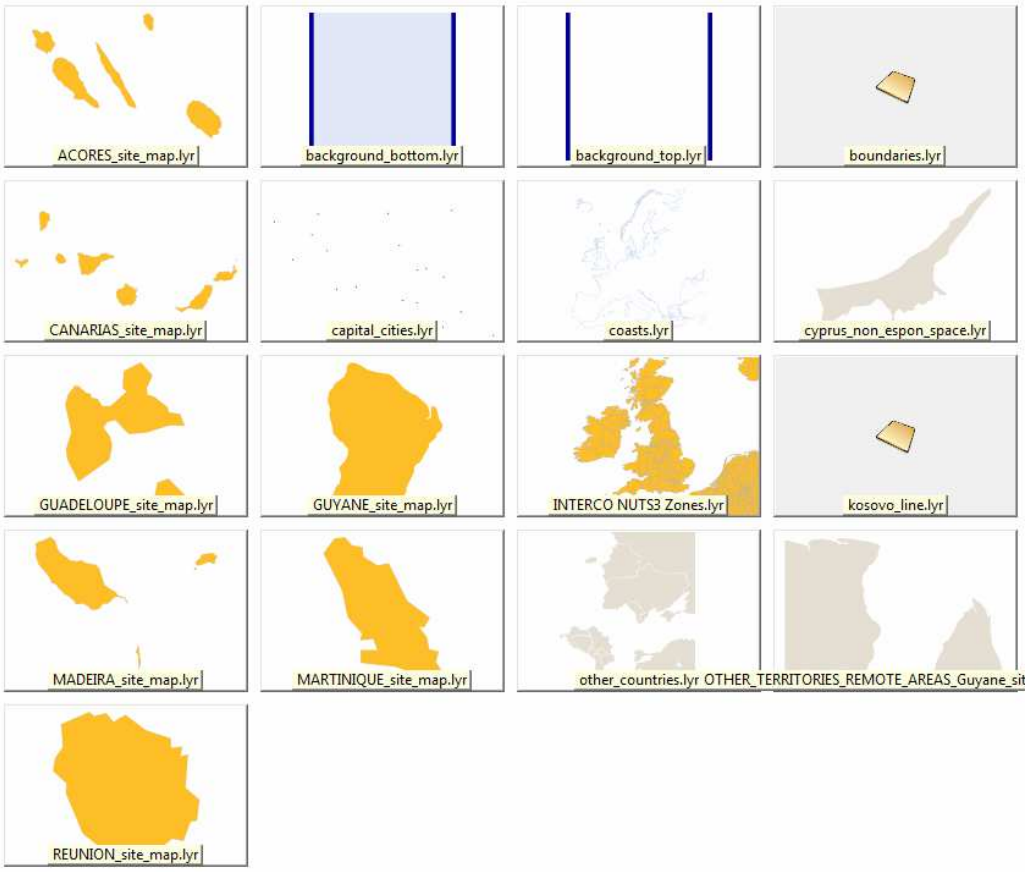


Figure 114. LYR files constituting the base map in thumbnails view (sample of all available layer files).

C.5.4. Indicator coding system

Basic principles

In order to allow a smooth processing of the indicators in the GIS and across different databases (INTERCO GIS Database, ESPON DB 2013, etc.), a unique INTERCO indicator coding system has been developed, which itself is based upon the TtOYS indicator coding system used in ESPON DB 2013.

The enhanced coding scheme for each indicator consists of six fields, of which five fields follow the original TtOYS structure, plus one additional field dedicated to store the indicator data type. Altogether the full code consists of 21 letters (combination of characters and numbers). The six fields are **`Category`**, **`Sub-category`**, **`Open field`**, **`Year`**, **`Space`** and **`Type`** (Figure 115).

Category		Sub-category		Open field							Year				Space		Type		
#	#	#	#	A	B	C	D	E	F	G	#	#	#	#	X	X	X	X	X

Figure 115. The INTERCO indicator coding scheme (TtOYS structure to code variables)

The fields **Category**, **Sub-category** and **Space** are filled with two characters each, the **Type** field with three characters, while the other two fields are more flexible. The **Open field** can take six to maximum eight characters and the field **Year** can take two up to four characters. To improve harmonisation, the ESPON DB instructions further proposed that letters and numbers should be written in a specific order and text displayed as either upper or lower case. The two pairs of digits representing **Category** and **Sub-category** are indicated in the first four characters of the code. The codes for the categories and sub-categories have already been presented in Table 10.

Beyond the categorisation provided in **Category** and **Sub-category**, it is necessary to give further details on the information that is being measured. This can be achieved by completing the **Open field**. In order to harmonise with other ESPON projects, the ESPON DB proposes three lists of abbreviations based on the current state of the database. The first two lists relate to subjects and to some adjectives and names widely used when labeling indicators (e.g. total, gender) and the third list should preferably remain fixed since it corresponds to measurement scales as recognised in the geographical/statistical literature.

In the **Open field**, upper case letters are used to identify the subject, up to three lower case characters are used to refine the subject and other lower case characters by the proposed lists of ESPON DB are used. For instance, the overall unemployment rate is abbreviated as UNEMALL in the **Open field.**

The **Year** field stores temporal information about the indicator. Two cases can be distinguished: if the indicator is available for only one year, the full year is provided (like 2009). If an indicator is available for a time interval of several years, the starting and the ending year of the period are given, both with the latter two numbers (e.g. a period of 2001-2008 will be abbreviated by 0108).

The **Space** field indicates the spatial level for which the indicator is available, as a two-digit code. The following abbreviations are possible (Table 11):

Abbreviation spatial level (2 digits)	Meaning
N0	Country level
N1	NUTS 1 level
N2	NUTS 2 level
N3	NUTS 3 level
N5	NUTS 5 level
L1	LAU 1 level
L2	LAU 2 level
UZ	Urban (morphological zone)
GR	Grid/raster

Table 11. Abbreviations indicating the spatial level in the indicator code

The data **Type** field indicates the type of indicator in question. It is a three-digit field that stores one of the following abbreviations (Table 12):

Abbreviation data type (3 digits)	Meaning
INT	Interval
MET	Metric
NOM	Nominal
NOU	Nominal unique
NOD	Nominal dichotomous
NOC	Nominal categorical
NOG	Nominal graded membership
ORD	Ordinal
ORU	Complete ordinal
ORC	Classed ordinal
RTO	Ratio
RTE	Extensive ratio
RTC	Count ratio
RTD	Derived ratio
RDE	Density ratio
RTY	Cyclic ratio
RTP	Constrained ratio

Table 12. Data type abbreviations used in the indicator code

The indicator codes need to be unique for each indicator. If there are two or more indicators with similar characteristics, the **`Open Field`** can be used to differentiate the indicator codes from each other.

Coding system implemented in INTERCO geodatabase

The indicator coding system described above is not only used in the fact sheets for indicator identification, but the codes are also used in the **`INTERCO_DB`** geodatabase as column headers (field names) in the data tables (Figure 116). Since the indicator codes are unique, by that the column headers in the tables are also distinctive. The benefit of using these codes in the database over using other names is their compactness and uniqueness.

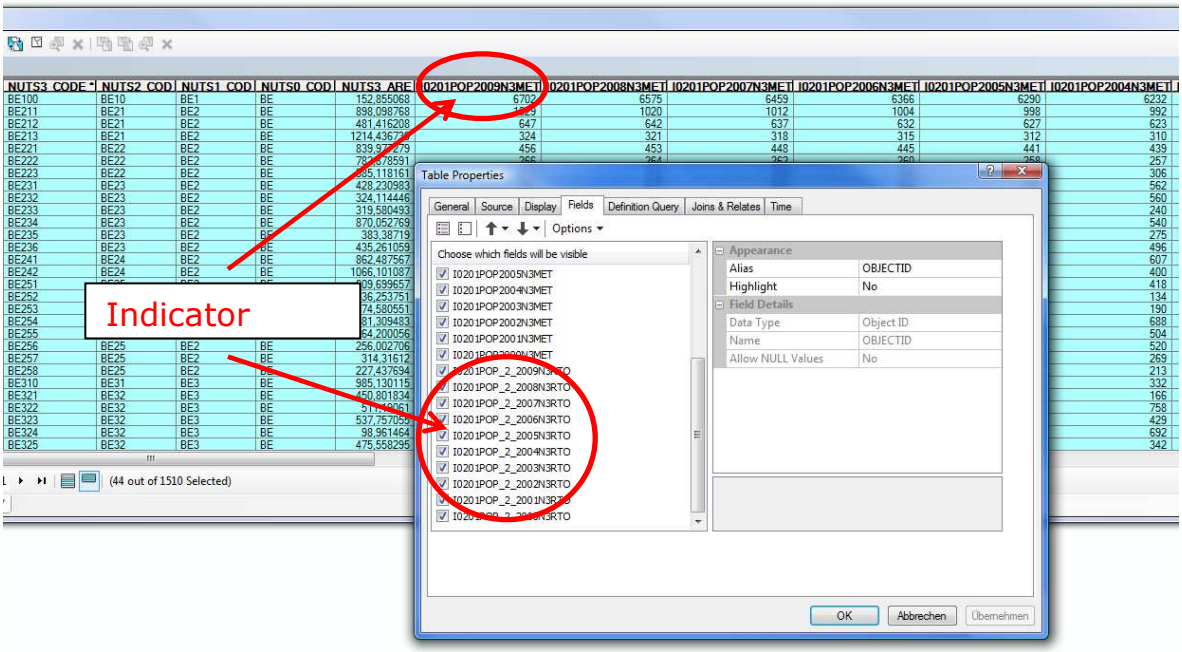


Figure 116. Indicator codes as field names in data tables of INTERCO_DB geodatabase

C.5.5. Files

Excel files

For those people who do not have ArcGIS available, or are non-GIS specialists, or for those who just want to work with the statistical data outside a GIS, the INTERCO projects offers all indicators in Excel file format.

The structure of the Excel files is easy to understand and straightforward. There will be one Excel file per indicator. Each file stores the indicator numbers (or input data) for all available years, where one column represents one year. The structure of these Excel file follows the instructions as given by the ESPON Database project, i.e. these Excel files can also be used to import the indicators into the overall ESPON database.

The column headers, contents and units of the indicators are described in the metadata documentation and in the user manual.

PNG and AI files

All indicator maps are exported from ArcGIS into **PNG** and Adobe Illustrator (AI) file format, i.e. raster format and vector graphics format, respectively. Both the **PNG** and **AI** files are provided through a subdirectory on the CD-ROM/DVD. From there they can directly be viewed, retrieved and imported into reports, presentations or other documents; even for those users who do not have a GIS system at hand. The AI files can even more be further processed in any drawing software.

CD-ROM / DVD folder structure

The overall output of the GIS works in INTERCO will be stored and will be made available in a comprehensive folder structure, including the GIS database, the documentation, the cartography, Excel tables as well as layer files.

The following folder structure has already been implemented to store the results of all INTERCO works:

- **CARTO** comprises all generated **MXD** files (ArcGIS Versions 10) for indicator mapping
- **DOC** metadata documentation and user manual for the INTERCO database
- **EXCEL** collection of Excel files in ESPON file format (input/output of indicator calculation)
- **LYRS** collection of layer files for mapping (referenced in **MXD** files)
- **MAPS** collection of maps in **PNG** & **AI** file format, exported from ArcGIS
- **TOOLS** sub-directory storing the INTERCO toolbox and the developed scripts

The actual **INTERCO_DB** PGDB is stored in parallel to these sub-directories.

Each of the directories **CARTO**, **EXCEL**, **LYRS** and **MAPS** have several sub-directories which are named after the territorial objectives (Table 13) to store the respective map templates (**CARTO**), indicator files (**EXCEL**), layer files (**LYRS)** or exported raster **PNG** and **AI** map files (**MAPS**).

Name of subdirectory	Territorial Objective
LOCAL_ECONOMIES	Strong local economies ensuring global competitiveness
INNOVATIVE_TERRITORIES	Innovative territories
ACCESS_TO_SERVICES	Fair access to services, market and jobs
QUALITY_OF_LIFE	Inclusion and quality of life
HIGH_ECOLOGICAL_VALUES	Attractive regions of high ecological values and strong territorial capital
POLYCENTRIC_DEVELOPMENT	Integrated polycentric territorial development

Table 13. Sub-directories under CARTO, EXCEL, LYRS and MAPS folders according to territorial objectives

ESPON

INTERCO
Indicators of territorial cohesion

Scientific Platform and Tools Project 2013/3/2

Final Report

Annexes to the Scientific report

EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

This report presents the final results of a “Scientific Platform and Tools” Project conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

Information on the ESPON Programme and projects can be found on www.espon.eu

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This basic report exists only in an electronic version.

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Croatia: CROSTAT, Republic of Croatia – Central Bureau of Statistics: http://www.dzs.hr/

FYROM: Republic of Macedonia State Statistical Office: http://www.stat.gov.mk/

Serbia: Serbia Republic Statistical office: http://webrzs.stat.gov.rs/WebSite/

Montenegro: Statistical Office of the Republic of Montenegro – MONSTAT: http://www.monstat.org/cg/

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Annex 1. The classification scheme

Table 1: Final classification of categories and sub-categories

Cat. nr	Category name	Sub-cat. nr	Sub-category name
1	AGRICULTURE AND FISHERIES	1.01	Land Use
		1.02	Farms Structure
		1.03	Employment
		1.04	Livestock
		1.05	Production
2	DEMOGRAPHY	2.01	Population Structure (age, sex, natural change)
		2.02	Migration
		2.03	Total population
		2.04	Urban - rural population
3	TRANSPORT, ACCESSIBILITY, COMMUNICATION	3.01	Transport Infrastructurre
		3.02	Passengers and Good Transport
		3.03	Accessibility
		3.04	Impacts of Transport Policies
		3.05	Information & Communication Technologies
4	ENERGY	4.01	Energy
5	LAND USE	5.01	Land Use
6	SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE	6.01	Households and dwellings
		6.02	Education
		6.03	Health
		6.04	Poverty
		6.05	Other social
		6.06	Culture
		6.07	Quality of life
7	ECONOMY, LABOUR FORCE	7.01	Labour force
		7.02	Employment, Unemployment
		7.03	Income and Consumption
		7.04	Investments, Finances and Expenditures
		7.05	Industry, Services
		7.06	Tourism
		7.07	Innovation
		7.08	Business, all sectors
8	ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS	8.01	Environment quality
		8.02	Natural assets
		8.03	Climate change
		8.04	Risks, Hazards
9	GOVERNANCE	9.01	Governance
10	TERRITORIAL STRUCTURE	10.01	Urban structure
		10.02	Regional/ Territorial structure
99	NON - CROSS-THEMATIC DATA	99.01	Integrative indices and typologies
		99.02	Geographical objects

Annex 2. Inventory of indicators (presented at the ESPON MC meeting in Budapest, 23 June 2011)

Indicator level	Thematic sub-cat. nr	Thematic category name	Thematic sub-category name	Indicator name	Criteria for selection							
						Policy evaluation framework	Policy documents					
					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
1. Synthetic/ composite (headline) indicators	2.01	DEMOGR	Population Structure (age, sex,	Demography index ["Regions 2020", EC 2008]		e					X	
	4.01	ENERGY	Energy	Energy index ["Regions 2020", EC 2008]		e					X	
	6.02	SOCIAL A	Education	Participation in life long learning		w						
	6.04	SOCIAL A	Poverty	Share of population living in households at risk of poverty severely materially deprived or with low work intensity		w	X			X		X
	99.01	NON - CR	Integrative indices and typologie	Globalisation index ["Regions 2020", EC 2008]		w					X	
	99.01	NON - CR	Integrative indices and typologie	Human Development Index		w						
	99.01	NON - CR	Integrative indices and typologie	Change in Lisbon Index, 2000–2008		w	X					
	99.01	NON - CR	Integrative indices and typologie	Regional competitiveness index (5th CR)		w	X					
2. Headline	2.01	DEMOGR	Population Structure (age, sex,	Ageing index (persons 65+ / persons 0-14)	x	e						
	2.01	DEMOGR	Population Structure (age, sex,	Dependency rate	x	e				X		
	2.01	DEMOGR	Population Structure (age, sex,	Life expectancy at birth	x	w				headline		
	2.01	DEMOGR	Population Structure (age, sex,	Life expectancy		w				X		
	2.03	DEMOGR	Total population	Population potential within 5 km	x	e						
	2.03	DEMOGR	Total population	Population average annual growth		e						
	4.01	ENERGY	Energy	Share of renewable energy in final energy consumption and increase needed to meet the 20% target	(x)	e	X			headline		headline
	6.02	SOCIAL A	Education	High education population	x	w						
	6.02	SOCIAL A	Education	Share high educated population in percent	x	w						
	6.02	SOCIAL A	Education	Population aged 30–34 with a tertiary education in 2008 and distance to Europe 2020 target (5th CR)	x	w	X					headline
	6.02	SOCIAL A	Education	Share of tertiary educated people in %	x	w						
	6.03	SOCIAL A	Health	Healthy life expectancy (ESPON 3.2)		w						
	6.03	SOCIAL A	Health	Self-perceived personal state of health in EU Member States (5th CR)		w	X					
	6.04	SOCIAL A	Poverty	At persistent risk of poverty rate (Population share with 60 % of the national equivalent median income)		w	X			headline		headline
	6.04	SOCIAL A	Poverty	Share of population living in workless or low work intensity households (5th CR)		w	X					
	6.05	SOCIAL A	Other social	Work-life balance in EU Member States (5th CR)		w	X					

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						Policy evaluation framework	Policy documents					
					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	6.07	SOCIAL A	Quality of life	Happiness Index		w	X	X				
	6.07	SOCIAL A	Quality of life	Share of population reporting crime, violence or vandalism by degree of urbanisation (5th CR) - 1st priority indicator		w	X					
	7.02	ECONOM	Employment, Unemployment	Difference between female and male employment rates, 20–64	x	w	X					
	7.02	ECONOM	Employment, Unemployment	Employment rate change (growth)	x	w		X				
	7.02	ECONOM	Employment, Unemployment	Unemployment rate per age: classes of 5 years	x	w	X					
	7.02	ECONOM	Employment, Unemployment	Development of unemployment rate (male, female, young, total, 99-04)	x	w						
	7.03	ECONOM	Income and Consumption	GDP per inhabitant (capita) in pps or euros, per year	~~x~~	w		headline				
	7.03	ECONOM	Income and Consumption	GDP change per inhabitant (capita) in pps or euros	x	w				X		
	7.03	ECONOM	Income and Consumption	Median disposable annual household income	x	w						
	7.04	ECONOM	Investments, Finances and Exp	Public sector debt relative to GDP		e	X					
	8.01	ENVIRON	Environment quality	NATURA 2000 area (Share of Natura 2000 area in %) (5th C.R.)		w	X					
	8.02	ENVIRON	Natural assets	Consumption of water per capita		e						
	99.01	NON - CR	Integrative indices and typologie	Intensity of multiple risks (number of challenges) for European Regions ("Regions 2020")	x	w					X	
	9.01	GOVERN	Governance	Electoral participation	x	w						
	9.01	GOVERN	Governance	WGI Index on voice and accountability		w						

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					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
3. Core	10.01	TERRITO	Urban structure	MEGA / Metropolitan European Growth Areas		e						
	2.03	DEMOGR	Total population	Population density		e						
	2.04	DEMOGR	Urban - rural population	Urban - rural population in Europe based on national classification		e						
	3.03	TRANSP(	Accessibility	Potential accessibility to GDP by road		e						
	3.03	TRANSP(	Accessibility	Potential accessibility to population by road	x	e						
	3.03	TRANSP(	Accessibility	Time to the nearest motorway access		e						
	3.03	TRANSP(	Accessibility	Travel time to railway stations	x	e						
	4.01	ENERGY	Energy	Energy intensity of the economy		e	X	X		X		headline
	4.01	ENERGY	Energy	Renewable energy consumption		e						
	6.02	SOCIAL A	Education	Early school leavers and distance to Europe 2020 target - 5th CR	x	w	X	X		X		headline
	6.03	SOCIAL A	Health	Health expenditure per capita		i						
	6.03	SOCIAL A	Health	Expenditure on health as part of GDP (national level)		i						
	6.04	SOCIAL A	Poverty	Number of homeless people as a proportion of total resident population		w						
	6.04	SOCIAL A	Poverty	Population suffering from severe material deprivation (% of total population) (5th CR)		w	X			X		X
	6.07	SOCIAL A	Quality of life	Happiness and GDP per head (5th CR)		w	X					
	6.07	SOCIAL A	Quality of life	Homicide rate (5th CR)		w	X					
	7.01	ECONOM	Labour force	Labour productivity, gross domestic product as PPP per person employed		e	X	headline		X		
	7.02	ECONOM	Employment, Unemployment	Employment rate change %, 20–64 years, in certain time period and distance to Europe 2020 target		w	X	X				headline
	7.07	ECONOM	Innovation	% of households having broadband access		e	X	X				X
	7.07	ECONOM	Innovation	Human Resources in Science and Technology (core) (5th CR)		e	X					
	7.07	ECONOM	Innovation	GERD (Gross domestic expenditure on research and development)		i		X		X		headline
	8.01	ENVIRON	Environment quality	Residence density		e						
	8.01	ENVIRON	Environment quality	Urban waste water treatment capacity (5th C.R.)		e		X		X		
	8.02	ENVIRON	Natural assets	Share of areas with high ecological value		w						

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					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	8.02	ENVIRON	Natural assets	Dwellings connected to potable water system		w						
	8.02	ENVIRON	Natural assets	% of green space per inhabitant		w						
	8.03	ENVIRON	Climate change	Greenhouse gas emission		e	X	X		headline		headline
	9.01	GOVERN	Governance	Trust in the legal system (Share of persons having complete trust/ no trust at all in the legal system of a counrty)		w						

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4. Analytical	10.01	TERRITO	Urban structure	Gini coefficient / Concentration Index (Standard measurement for		...						
	2.03	DEMOGR	Total population	Total population change (5th CR)		e	X					
	3.01	TRANSPO	Transport Infrastructurre	Density of motorways, trunk roads, railways		o						
	3.01	TRANSPO	Transport Infrastructurre	Secondary transport networks		o						
	3.02	TRANSPO	Passengers and Good Transpor	Frequency and average speed of cross-border transportation lines		e						
	3.03	TRANSPO	Accessibility	Congestion cost		e=>w						
	3.03	TRANSPO	Accessibility	Congestion index on the main road network(5th CR) - 1st priority		e	X					
	3.03	TRANSPO	Accessibility	Logistics efficiency		e						
	3.03	TRANSPO	Accessibility	Multimodal/road/rail potential accessibility		e						
	3.03	TRANSPO	Accessibility	Potential accessibility to GDP by air		e						
	3.03	TRANSPO	Accessibility	Potential accessibility to population (mutlimodal)	x	e						
	3.03	TRANSPO	Accessibility	Potential accessibility to population by air	x	e						
	4.01	ENERGY	Energy	Energy impacts (on agric, landscapes, etc)		w=>w						
	4.01	ENERGY	Energy	Renewable energies and their environmental cost		e=>w						
	4.01	ENERGY	Energy	Production of renewable energy per country ?		e						
	4.01	ENERGY	Energy	Solar energy resources per NUTS 3 regions hours (5th CR)		w	X					
	4.01	ENERGY	Energy	Wind energy potential: on shore full load hours (5th CR)		w	X					
	5.01	LAND US	Land Use	Land cover / land use in selected cities (5th C.R.)		w	X					
	6.02	SOCIAL A	Education	Population with a tertiary education per age group (5th CR)		w	X					
	6.03	SOCIAL A	Health	Number of beds and number of employees in health services		o						
	6.03	SOCIAL A	Health	Share of population reporting difficulty of access to primary healthcare by		e	X					
	6.04	SOCIAL A	Poverty	Human Poverty Index (5th CR)		w	X					
	~~6.04~~	~~SOCIAL A~~	~~Poverty~~	~~UN Human Poverty Index 2 (5th CR)~~		~~w~~	~~X~~					
	6.04	SOCIAL A	Poverty	Share of population at risk of poverty by degree of urbanisation (5th CR)		w	X					
	6.04	SOCIAL A	Poverty	Population at risk of poverty after social transfers (5th CR)		w	X	X		X		X
	6.04	SOCIAL A	Poverty	Share of population unable to face unexpected financial expenses by		w	X					
	6.07	SOCIAL A	Quality of life	Share of population disagreeing with statement:'Generally speaking, most		w	X					
	7.01	ECONOM	Labour force	Labour Force Replacement population of ages 10-19 / population of ages		e						
	7.02	ECONOM	Employment, Unemployment	Difference in employment rates between people born inside the EU and		w	X					
	7.02	ECONOM	Employment, Unemployment	Estimated employment creation induced by Cohesion Policy expenditure		i=>w	X					
	~~7.03~~	~~ECONOM~~	~~Income and Consumption~~	~~Relative GDP~~		~~...~~						
	7.04	ECONOM	Investments, Finances and Expe	7th Framework Programme, average funding per head (5th CR)		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Cohesion Policy expenditure on the environment by Policy area (5th CR)		i	X					
	7.08	ECONOM	Business, all sectors	Cluster focus		...						
	8.01	ENVIRON	Environment quality	% dwellings connected to sewage treatment system		w						
	~~8.01~~	~~ENVIRON~~	~~Environment quality~~	~~PM10 concentrations~~	~~x~~	w						
	8.02	ENVIRON	Natural assets	% of fragmented natural areas		w						
	8.02	ENVIRON	Natural assets	Species diversity	x	w						
	8.02	ENVIRON	Natural assets	Fragmentation index		metric						
	8.03	ENVIRON	Climate change	Climate change index ("Regions 2020", EC 2008)		...					X	
	8.03	ENVIRON	Climate change	Greenhouse gas emissions change		...						
	8.03	ENVIRON	Climate change	Greenhouse gas emissions (Percentage change in emissions of 6 main		...						
	8.03	ENVIRON	Climate change	NO2 concentrations		...						
	8.03	ENVIRON	Climate change	Ozone concentrations	x	w						
	8.03	ENVIRON	Climate change	Ozone concentration exceedances in NUTS 3 regions (5th C. R.) -		...	X					
	8.03	ENVIRON	Climate change	Soil sealing per inhabitant, 2006 (5th CR) - 1st priority	x	...	X					
	8.03	ENVIRON	Climate change	Projected change of temperature and precipitation between 1961–1990		...	X					

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					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	8.03	ENVIRON	Climate change	Projected change in Tourism Climate Index (5th C.R.)		...	X					
	8.03	ENVIRON	Climate change	Vulnerability of NUTS2 regions to climate change (5th C.R.)	(x)	...	X					
	8.04	ENVIRON	Risks, hazards	Island Vulnerability index		...						
	9.01	GOVERN	Governance	Share of persons working in an organisation or association (other than a		w						
	9.01	GOVERN	Governance	WGI Index on control of corruption		e						
	9.01	GOVERN	Governance	WGI Index on government effectiveness		e						
	9.01	GOVERN	Governance	WGI Index on political stability and absence of violence		e						
	9.01	GOVERN	Governance	WGI Index on regulatory quality		e						
	9.01	GOVERN	Governance	WGI Index on rule of law		e						
	~~99.01~~	~~NON - CF~~	~~Integrative indices and typologie~~	~~Globalisation vulnerability index~~		~~w~~					~~X~~	
	99.01	NON - CF	Integrative indices and typologie	Potential increase in GDP per head from raising employment rate, 20–64,		...	X					
	99.01	NON - CF	Integrative indices and typologie	Potential increase in GDP per head from raising the share of tertiary-		...	X					
	99.01	NON - CF	Integrative indices and typologie	Public expenditure on social protection as a share of GDP and per head of		i	X					

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					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
5. Other				~~1.5 Regional potential: Human potential - Overlapping with~~		...						
	10.01	TERRITO	Urban structure	Flows and kind of flows within functional areas		...						
	10.01	TERRITO	Urban structure	FUA / Functional Urban Areas		...						
	10.01	TERRITO	Urban structure	FUA primacy rate		...						
	10.01	TERRITO	Urban structure	MEGA population change		...						
	10.01	TERRITO	Urban structure	PIA / Potential Integration Areas population change		...						
	10.01	TERRITO	Urban structure	PUSH areas population change		...						
	10.01	TERRITO	Urban structure	Settlement area in PUSH		...						
	10.01	TERRITO	Urban structure	See also indicators in ESPON 1.1.1		...						
	10.01	TERRITO	Urban structure	Rank of PIAs		...						
	10.01	TERRITO	Urban structure	PUSH areas population		...						
	10.01	TERRITO	Urban structure	Settlement units within the PUSH		...						
	10.01	TERRITO	Urban structure	Employment by professional status in cities		...						
	10.01	TERRITO	Urban structure	Primacy rate -Share of the largest urban area within an		...						
	10.01	TERRITO	Urban structure	Human intervention		...						
	10.01	TERRITO	Urban structure	Urban sprawl		...						
	10.01	TERRITO	Urban structure	Size and spacing of cities or of FUA		...						
	10.01	TERRITO	Urban structure	Degree of urbanisation		...	X					
	10.01	TERRITO	Urban structure	Population age structure by urban-rural typology		...	X					
	10.01	TERRITO	Urban structure	Population change, natural change and migration by urban-rural typology,		...	X					
	10.01	TERRITO	Urban structure	Share of population by urban-rural typology, 2007		...	X					
	10.01	TERRITO	Urban structure	Urban-rural typology of NUTS3 regions (proportion of each category to all		...	X					
	10.01	TERRITO	Urban structure	GDP per head (PPS) in 2007 and change 2000–2007 by urban-rural		...	X					
	10.01	TERRITO	Urban structure	Share of FUA-Population in NUTS 2, NUTS3		...						
	10.01	TERRITO	Urban structure	Share of population in cities below 50.000 inhabitants		...						
	10.02	TERRITO	Regional/ Territorial structure	Population commuting to other regions / working in the same region		...						
	10.02	TERRITO	Regional/ Territorial structure	Region´s share of EU 27+2 GDP in PPS, Change in percent		...						
	10.02	TERRITO	Regional/ Territorial structure	Polycentric index for European regions	x	...						
	10.02	TERRITO	Regional/ Territorial structure	Geographical specificities ("Specific regions"): Several indicators included		...						
	10.02	TERRITO	Regional/ Territorial structure	Additive combination of classified economy indicators divided by # of		...						
	10.02	TERRITO	Regional/ Territorial structure	Classified economy		...						
	10.02	TERRITO	Regional/ Territorial structure	Region´s share of EU 27+2 population, Change in percent		...						
	10.02	TERRITO	Regional/ Territorial structure	Additive combination of classified labour market indicators divided by # of		...						
	10.02	TERRITO	Regional/ Territorial structure	Classified demography		...						
	10.02	TERRITO	Regional/ Territorial structure	Additive combination of classified demography indicators divided by # of		...						
	10.02	TERRITO	Regional/ Territorial structure	Classified labour market		...						
	10.02	TERRITO	Regional/ Territorial structure	Employment and commuting among NUTS level 2 regions		...						
	10.02	TERRITO	Regional/ Territorial structure	Additive combination of classified accessibility indicators divided by # of		...						
	10.02	TERRITO	Regional/ Territorial structure	Additive combination of classified environment indicators divided by # of		...						
	10.02	TERRITO	Regional/ Territorial structure	Additive combination of classified hazard indicators divided by # of		...						
	1.01	AGRICUL	Land Use	Agriculture - bio-fuels (areas occupied)		...						
	1.01	AGRICUL	Land Use	Utilised agricultural areas		...						
	1.02	AGRICUL	Farms Structure	% (change of) holders who are full time		...						
	1.02	AGRICUL	Farms Structure	Total number of Holders		...						
	1.02	AGRICUL	Farms Structure	55yrs < change in holders < 35yrs		...						
	1.02	AGRICUL	Farms Structure	Age of farm holders		...						
	1.02	AGRICUL	Farms Structure	Number of farm holdings		...						

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	1.02	AGRICUL	Farms Structure	Number of Holders in Fishing and agriculture		...						
	1.02	AGRICUL	Farms Structure	Number of Holders in Forestry and logging		...						
	1.02	AGRICUL	Farms Structure	% (change in number) of holdings > x ESU (European Size Unit)		...						
	1.02	AGRICUL	Farms Structure	% of holdings with an OGA (Other Gainful Activity)		...						
	1.03	AGRICUL	Employment	Annual work unit (AWU) per European Size Unit(ESU)[Standard Gross		...						
	1.03	AGRICUL	Employment	Persons working in agriculture		...						
	1.03	AGRICUL	Employment	Persons working in fishing		...						
	1.03	AGRICUL	Employment	Persons working in forestry		...						
	1.04	AGRICUL	Livestock	Livestock		...						
	1.05	AGRICUL	Production	Fishing		...						
	1.05	AGRICUL	Production	Aquaculture		...						
	1.05	AGRICUL	Production	Agriculture - peri-urban agriculture (incl. changes)		...						
	1.05	AGRICUL	Production	Added value in Agriculture, Forestry and		...						
	1.05	AGRICUL	Production	Agriculture turnover		...						
	1.05	AGRICUL	Production	Agriculture - type		...						
	1.05	AGRICUL	Production	Output-Input ratio in agriculture		...						
	2.01	DEMOGR	Population Structure (age, sex, r	Population pyramid		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Ageing of population		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Crude birth rate / Crude death rate		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Index of demographic sustainability (ESPON 3.2)		...						
	2.01	DEMOGR	Population Structure (age, sex, r	Population between 15 and 64 years		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Population with 65 and more years		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Resident population (total, gender proportion)		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Share of children		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Aged People vs. Youth		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Share of population in the ages over 65 in percent		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Male life expectancy at birth (5th CR)		w	X					
	2.01	DEMOGR	Population Structure (age, sex, r	Natural population growth (5th CR)		e	X					
	2.01	DEMOGR	Population Structure (age, sex, r	Standardised death rate from cancer for population under 65 (5th CR)		w	X					
	2.01	DEMOGR	Population Structure (age, sex, r	Standardised death rate from heart disease for population under 65 (5th		w	X					
	2.01	DEMOGR	Population Structure (age, sex, r	Standardised death rate from suicide for population under 65 (5th CR)		w	X					
	2.01	DEMOGR	Population Structure (age, sex, r	Ageing "Labour Force"		...						
	2.01	DEMOGR	Population Structure (age, sex, r	Female life expectancy at birth (5th CR)		w	X					
	2.01	DEMOGR	Population Structure (age, sex, r	Index of sustainable demographic development (ISDD)		...						
	2.01	DEMOGR	Population Structure (age, sex, r	Infant mortality rate (5th CR)		w	X					
	2.01	DEMOGR	Population Structure (age, sex, r	Changes in Natural Growth Potential		...						
	2.01	DEMOGR	Population Structure (age, sex, r	Population by sex and age		e						
	2.01	DEMOGR	Population Structure (age, sex, r	Total fertility rate		e						
	2.02	DEMOGR	Migration	In migration, Out migration, Emigration , Immigration		...						
	2.02	DEMOGR	Migration	Migration by country of origin and destination		...						
	2.02	DEMOGR	Migration	Internal mobility by region		...						
	2.02	DEMOGR	Migration	Migratory balance by regions		...						
	2.02	DEMOGR	Migration	- in migration (related to educ. level)		...						
	2.02	DEMOGR	Migration	Nationals, EU nationals, Non-EU nationals that have moved into the city		...						
	2.02	DEMOGR	Migration	Residents' citizenship		...						
	2.02	DEMOGR	Migration	Nationals as a proportion of the total population		...						
	2.02	DEMOGR	Migration	Internal / External / Total / Absolute migratory balance		...						

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	2.02	DEMOGR	Migration	Net migration rate	x	...						
	2.02	DEMOGR	Migration	Emigration & immigration per country, in migration & out migration per		...						
	2.02	DEMOGR	Migration	Net migration into NUTS3 regions (5th CR)		...	X					
	2.02	DEMOGR	Migration	Population aged 15–64 born outside the EU (5th CR)		...	X					
	2.02	DEMOGR	Migration	Share of working age residents who moved from a different Euregion (5th		...	X					
	2.03	DEMOGR	Total population	Components of population development		...						
	2.03	DEMOGR	Total population	Variation of the population 2000-2050		...						
	2.03	DEMOGR	Total population	PSR in 2050		...						
	2.03	DEMOGR	Total population	Population projections		...						
	~~2.03~~	~~DEMOGR~~	~~Total population~~	~~Population size per region~~		...						
	2.03	DEMOGR	Total population	Population change		...						
	2.03	DEMOGR	Total population	Population number per region [Avg size]		...						
	2.04	DEMOGR	Urban - rural population	Relative rurality based on national classifications		...						
	2.04	DEMOGR	Urban - rural population	% of the total country population living in top-largest city (and or cities)		...						
	2.04	DEMOGR	Urban - rural population	Rural population per NUTS		...						
	2.04	DEMOGR	Urban - rural population	Urban population per NUTS		...						
	3.01	TRANSP	Transport Infrastructurre	Traffic separation in different infrastructure levels		...						
	3.01	TRANSP	Transport Infrastructurre	Productivity of inland infrastructure		...						
	3.01	TRANSP	Transport Infrastructurre	Productivy of airports		...						
	3.01	TRANSP	Transport Infrastructurre	Number and quality of connections to hubs and urban centres		...						
	3.01	TRANSP	Transport Infrastructurre	Airports and harbours of global governance		...						
	3.01	TRANSP	Transport Infrastructurre	Urban transportations / public transportations		...						
	3.01	TRANSP	Transport Infrastructurre	Highest speed on railway sections according to timetables (5th CR)		...	X					
	3.01	TRANSP	Transport Infrastructurre	Motorways in relation to potential population (5th CR)		...	X					
	3.01	TRANSP	Transport Infrastructurre	Real GDP change due to TEN-T investments (5th CR)		...	X	X				
	3.01	TRANSP	Transport Infrastructurre	Roads (km) and railways		...						
	3.02	TRANSP	Passengers and Good Transpor	Number of passengers travelling by air		...						
	3.02	TRANSP	Passengers and Good Transpor	Spending on transport fuel for freight as % of GDP		...						
	3.02	TRANSP	Passengers and Good Transpor	Road freight crossing the region borders		...						
	3.02	TRANSP	Passengers and Good Transpor	External passengers (outside the region) at more than 3h		...						
	3.02	TRANSP	Passengers and Good Transpor	Volume of freight transport relative to GDP		...						
	3.02	TRANSP	Passengers and Good Transpor	Passenger flights of less than 500km (5th CR)		...	X					
	3.02	TRANSP	Passengers and Good Transpor	Passenger trains on the TEN-T railway network (5th CR)		...	X					
	3.02	TRANSP	Passengers and Good Transpor	Road fatalities (5th CR)		...	X					
	3.02	TRANSP	Passengers and Good Transpor	Share of freight by mode of transport in EU Member States (5th CR)		...	X					
	3.02	TRANSP	Passengers and Good Transpor	Share of passengers by mode of transport in EU Member States (5th CR)		...	X					
	3.03	TRANSP	Accessibility	Accessibility		...						
	3.03	TRANSP	Accessibility	Connectivity to commercial airports		...						
	3.03	TRANSP	Accessibility	Car driving time to the nearest (x) facility		...						
	3.03	TRANSP	Accessibility	Access to high-speed train services		...						
	3.03	TRANSP	Accessibility	Daily market accessible by car in terms of GDP		...						
	3.03	TRANSP	Accessibility	Accessibility (incl. Maritime transport) - new technologies		...						
	3.03	TRANSP	Accessibility	Accessibility (incl. Maritime transport) - reliability		...						
	3.03	TRANSP	Accessibility	Accessibility (incl. Maritime transport) - costs of accessibility		e						
	3.03	TRANSP	Accessibility	Accessibility (incl. Maritime transport) - interlinkage between international		...						
	3.03	TRANSP	Accessibility	Accessibility (incl. Maritime transport) - modal split in the regional transport		...						
	3.03	TRANSP	Accessibility	Car travel time to commercial airports		...						

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						Policy evaluation framework	Policy documents					
					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	3.03	TRANSPO	Accessibility	Car travel time to universities/polytechniques/hospitals		...						
	3.03	TRANSPO	Accessibility	Classified accessibility		...						
	3.03	TRANSPO	Accessibility	Stock of vehicles by category at regional level		...						
	3.03	TRANSPO	Accessibility	Water access		...						
	3.03	TRANSPO	Accessibility	Local accessibility		...						
	3.03	TRANSPO	Accessibility	Access to green space		...						
	3.03	TRANSPO	Accessibility	Accessibility to passenger flights 2008 (5th CR)		...	X					
	3.03	TRANSPO	Accessibility	Estimated increase in rail accessibility: current situation relative to low-		...	X					
	3.03	TRANSPO	Accessibility	Estimated increase in road accessibility: current situation relative to low-		...	X					
	3.03	TRANSPO	Accessibility	Potential increase in rail accessibility: high-speed scenario relative to		...	X					
	3.03	TRANSPO	Accessibility	Potential increase in road accessibility depending on high-speed scenario		...	X					
	3.03	TRANSPO	Accessibility	Accessibility time to market		...						
	3.03	TRANSPO	Accessibility	Accessibility to the nearest/ most frequently used hospital		...						
	3.03	TRANSPO	Accessibility	Average travel time to three higher hierarchical cities		...						
	3.03	TRANSPO	Accessibility	Peripherality indicator by car with respect to population		...						
	3.03	TRANSPO	Accessibility	Potential accessibilityn - for weigting incentives to areas		...						
	3.03	TRANSPO	Accessibility	Proportion of regional population within 1 hour car travel time to next		...						
	3.03	TRANSPO	Accessibility	Regional road connectivity		...						
	3.04	TRANSPO	Impacts of Transport Policies	Age of car park		...						
	3.05	TRANSPO	Information & Communication Te	Share of business internet users		...						
	3.05	TRANSPO	Information & Communication Te	Proportion of firms with own website		...						
	3.05	TRANSPO	Information & Communication Te	E-accessibility / ease of use ICTs (NUTS 0)		...						
	3.05	TRANSPO	Information & Communication Te	Broadband coverage in persons, firms, companies websites		...						
	3.05	TRANSPO	Information & Communication Te	Companies with internet access		...						
	3.05	TRANSPO	Information & Communication Te	Human ressources in science and technology		...						
	3.05	TRANSPO	Information & Communication Te	Share of private internet users		...						
	4.01	ENERGY	Energy	Electricity / Gas Prices		...		X				
	4.01	ENERGY	Energy	Energy Inland consumption		...						
	4.01	ENERGY	Energy	Private energy use		...						
	4.01	ENERGY	Energy	Final Energy Demand		...						
	4.01	ENERGY	Energy	Energy Net Imports		...						
	4.01	ENERGY	Energy	Energy Production		...						
	4.01	ENERGY	Energy	Electricity Generation		...						
	4.01	ENERGY	Energy	% employment in industries with high energy purchases		...						
	4.01	ENERGY	Energy	Energy source		...						
	4.01	ENERGY	Energy	- share of total energy produced/consumed		...						
	4.01	ENERGY	Energy	% of GVA in industries with high energy purchases		...						
	4.01	ENERGY	Energy	Local potential in renewable energies		w						
	4.01	ENERGY	Energy	Total energy consumption		...						
	~~4.01~~	~~ENERGY~~	~~Energy~~	~~Energy intensity of the economy~~		...						
	4.01	ENERGY	Energy	Photovoltaic potential		...						
	4.01	ENERGY	Energy	Renewable electricity production at country level, worldwide		e						
	4.01	ENERGY	Energy	Share of renewable generation in respect to total electricity generation at		e						
	4.01	ENERGY	Energy	Solar energy resources in NUTS3 regions (5th C.R.)		...	X					
	4.01	ENERGY	Energy	Source of investments in energy (share of european, national, local)		...						
	4.01	ENERGY	Energy	Wind Power Energy Potential 2005		...						
	5.01	LAND US	Land Use	Agriculture - use of good agric soils for urban development		...						

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	5.01	LAND US	Land Use	Total area of the regions (land use total) in km2		...						
	5.01	LAND US	Land use	Corine LC Natural surface		...						
	5.01	LAND US	Land Use	Land consumption by type of activity		...						
	5.01	LAND US	Land Use	Land consumption by transport infrastructure		...						
	5.01	LAND US	Land use	Percentage of artificial area - Corine		...						
	5.01	LAND US	Land Use	(Total agricultural area entered into agri-environment schemes under		...						
	5.01	LAND US	Land use	Corine LC Artificial surface		...						
	5.01	LAND US	Land Use	Agricultural intensity		...						
	~~5.01~~	~~LAND US~~	~~Land use~~	~~Artificial surfaces / territories~~		...						
	5.01	LAND US	Land Use	Loss of land from agriculture to artificial surfaces		...						
	5.01	LAND US	Land use	Land use changes		...						
	5.01	LAND US	Land Use	% of the area in green space/ sports/commercial activities/transports		...						
	5.01	LAND US	Land use	CORINE land use		...						
	5.01	LAND US	Land Use	Proportion morphological city area outside administrative limits		...						
	6.01	SOCIAL A	Households and dwellings	Lone - person		...						
	6.01	SOCIAL A	Households and dwellings	Lone - parent		...						
	6.01	SOCIAL A	Households and dwellings	% households living in social housing		...						
	6.01	SOCIAL A	Households and dwellings	Households living in owned housing, in social housing, in private rented		...						
	6.01	SOCIAL A	Households and dwellings	Number of dwellings		...						
	6.01	SOCIAL A	Households and dwellings	Proportion of dwellings lacking basic amenities		...						
	6.01	SOCIAL A	Households and dwellings	Proportion of households reliant upon social security		...						
	6.01	SOCIAL A	Households and dwellings	Cost of housing (in relation to purchase power)		w						
	6.01	SOCIAL A	Households and dwellings	The share of households receiving less than half of the national average		...						
	6.01	SOCIAL A	Households and dwellings	Average occupancy per occupied dwelling		...						
	6.01	SOCIAL A	Households and dwellings	Empty conventional dwellings		...						
	6.01	SOCIAL A	Households and dwellings	Average price of dwelling		...						
	6.01	SOCIAL A	Households and dwellings	Average area of living accommodation (m2 per person)		...						
	6.01	SOCIAL A	Households and dwellings	Households with children aged to under 18		...						
	6.02	SOCIAL A	Education	Number of person by educational attainment		...						
	6.02	SOCIAL A	Education	Languages spoken (native / at high level / etc)		...						
	6.02	SOCIAL A	Education	Number of students by different level of education		...						
	6.02	SOCIAL A	Education	Levels of education attained by population (NUTS 0)		...						
	6.02	SOCIAL A	Education	Highest education attainment		...						
	6.02	SOCIAL A	Education	% of women by level, worldwide of education at country level, worldwide		...						
	6.02	SOCIAL A	Education	Low achievers in mathematics, reading and science (5th CR)		...	X					
	6.02	SOCIAL A	Education	Participation of adults aged 25–64 in education and training (5th CR)		...	X					
	6.02	SOCIAL A	Education	Population aged 25–64 with low education (5th CR)		...	X					
	6.02	SOCIAL A	Education	Proportion of population with only basic education by country and regional		...	X					
	6.02	SOCIAL A	Education	Accessibility to High Secondary School		...						
	6.02	SOCIAL A	Education	Accessibility to Technological Education		...						
	6.02	SOCIAL A	Education	Accessibility to training structures		...						
	6.02	SOCIAL A	Education	Early school leavers		...						X
	6.02	SOCIAL A	Education	Education expenditure as % of GDP		i						
	6.02	SOCIAL A	Education	Public expenditure on education as a share of GDP and per head of		i	X					
	6.02	SOCIAL A	Education	Enrollment ratios in secondary and tertiary education at country level,		...						
	6.02	SOCIAL A	Education	Gender balance of population aged 25–34 with tertiary education (5th CR)		...	X					
	6.02	SOCIAL A	Education	Gender balance of population aged 55–64 with tertiary education (5th CR)		...	X					

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	6.02	SOCIAL A	Education	Youth education attainment level		...	X	X				
	6.03	SOCIAL A	Health	Public health expenditure (% of GNP or GDP)		i						
	6.04	SOCIAL A	Poverty	At risk of poverty rates in five less developed Member States		...	X					
	6.04	SOCIAL A	Poverty	Changes in material deprivation and net household income in five less		...	X					
	6.04	SOCIAL A	Poverty	Share of population materially deprived and severaly deprived by degree		...	X					
	6.05	SOCIAL A	Other social	Proportion of individuals reliant on social security		...						
	6.05	SOCIAL A	Other social	Share of children 0-2 years old in childcare		...						
	6.05	SOCIAL A	Other social	Share of population reporting difficulty of access to banking services by		e	X					
	6.05	SOCIAL A	Other social	Share of population reporting difficulty of access to compulsory schools by		e	X					
	6.06	SOCIAL A	Culture	Density of monuments		...						
	6.06	SOCIAL A	Culture	Infrastructures for Cultural Activities (Number of places for cultural events		...						
	6.06	SOCIAL A	Culture	Number of monuments per NUTS 2, 3 areas		...						
	6.06	SOCIAL A	Culture	Number of cultural sites (including monuments)		...						
	6.06	SOCIAL A	Culture	UNESCO World Heritage Sites per region		...						
	6.06	SOCIAL A	Culture	Multicultural society (% Ethnic minorities and other nationalities in		...						
	6.06	SOCIAL A	Culture	Access to cultural services		...						
	6.06	SOCIAL A	Culture	Share of UNESCO cultural landscapes and conjuncts		...						
	6.07	SOCIAL A	Quality of life	Services of general interest - location of services		...						
	6.07	SOCIAL A	Quality of life	Services of general interest - accessibility in time		...						
	6.07	SOCIAL A	Quality of life	Services of general interest - quality provided		...						
	6.07	SOCIAL A	Quality of life	Services of general interest - minimum level needed		...						
	6.07	SOCIAL A	Quality of life	Services of general interest - in functional areas, for each of the services		...						
	6.07	SOCIAL A	Quality of life	Quality of life indicators (HDI, trust in the future, etc)		...						
	6.07	SOCIAL A	Quality of life	Inhabitants satisfaction (// GDP, neg. Agglomaration effects)		...						
	6.07	SOCIAL A	Quality of life	Happiness and life satisfaction indices in 5 less developed Member States		...	X					
	6.07	SOCIAL A	Quality of life	Level of security		w						
	6.07	SOCIAL A	Quality of life	Number of murders and violent deaths for 1.000 residents		w						
	6.07	SOCIAL A	Quality of life	Level of satisfaction of residents with aspects of quality of life in selected		...	X					
		ECONOMY, LABOUR FORCE		Theil index		...						
	7.01	ECONOM	Labour force	Female activity rate		...						
	7.01	ECONOM	Labour force	Male activity rate		...						
	7.01	ECONOM	Labour force	Creative workforce		...						
	7.01	ECONOM	Labour force	Total active population		...						
	7.01	ECONOM	Labour force	Economic activity rate per year and change		...						
	7.01	ECONOM	Labour force	Labour costs		e						
	7.01	ECONOM	Labour force	Total labour force at country level, worldwide		...						
	7.01	ECONOM	Labour force	Productivity - GDP per person employed		e						
	~~7.01~~	~~ECONOM~~	~~Labour force~~	~~Labour productivity, gross domestic product as PPP per person employed~~		e						
	7.01	ECONOM	Labour force	Productivity growth through employment shifts between sectors (5th CR)		e=>e	X					
	7.01	ECONOM	Labour force	Labour productivity in industry and services		e	X					
	7.01	ECONOM	Labour force	Labour productivity in industry and services (GDP per head) [annual %		e	X					
	7.01	ECONOM	Labour force	Sources of growth in labour productivity		e	X					
	7.02	ECONOM	Employment, Unemployment	Persons employed per km²		...						
	7.02	ECONOM	Employment, Unemployment	% of employed by gender and age		...						
	7.02	ECONOM	Employment, Unemployment	% of employed in primary, secondary and tertiary sector		...						
	7.02	ECONOM	Employment, Unemployment	% of employed in public and private sector		...						
	7.02	ECONOM	Employment, Unemployment	Employment in the NACE groups of activities		...						

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						Policy evaluation framework	Policy documents					
					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	7.02	ECONOM	Employment, Unemployment	Self - employment rate (residents)		...						
	7.02	ECONOM	Employment, Unemployment	Cross-border commuters		...						
	~~7.02~~	~~ECONOM~~	~~Employment, Unemployment~~	~~Long term unemployment rate~~		...						
	7.02	ECONOM	Employment, Unemployment	Old active unemployment rate		...						
	7.02	ECONOM	Employment, Unemployment	Total number of unemployed by sector		...						
	7.02	ECONOM	Employment, Unemployment	Employment - number of people and type of work		...						
	7.02	ECONOM	Employment, Unemployment	Coefficient of variation of unemployment rate		...						
	7.02	ECONOM	Employment, Unemployment	Dispersion of regional unemployment rates		...						
	7.02	ECONOM	Employment, Unemployment	Employment commuting among NUTS3 regions		...						
	7.02	ECONOM	Employment, Unemployment	Persons employed in Agriculture 2001 in percent of total		...						
	7.02	ECONOM	Employment, Unemployment	Persons employed in Services 2001 in percent of total		...						
	7.02	ECONOM	Employment, Unemployment	Percentage of employment in high and medium tech manufacturing		...						
	7.02	ECONOM	Employment, Unemployment	Percentage of employment in knowledge intensive high technology		...						
	7.02	ECONOM	Employment, Unemployment	Employment in innovation / RDI / high tech activities		...						
	7.02	ECONOM	Employment, Unemployment	Part-time employment by gender		...						
	7.02	ECONOM	Employment, Unemployment	Employment density		...						
	7.02	ECONOM	Employment, Unemployment	Employment (levels -000s)		...						
	7.02	ECONOM	Employment, Unemployment	Unemployment rate, over/under 25 years		...						
	7.02	ECONOM	Employment, Unemployment	Employment rate		...						
	7.02	ECONOM	Employment, Unemployment	Employment rate of older workers		...						
	7.02	ECONOM	Employment, Unemployment	Employment by sector of operation (2 digits)		...						
	7.02	ECONOM	Employment, Unemployment	Employment in ICT/science and technology		...						
	7.02	ECONOM	Employment, Unemployment	Employment by sector at local level		...						
	7.02	ECONOM	Employment, Unemployment	Change in unemployment rate		...	X					
	7.02	ECONOM	Employment, Unemployment	Employment in high-technology sectors		...	X					
	7.02	ECONOM	Employment, Unemployment	Long-term unemployment rate (5th C.R.)		...	X					
	7.02	ECONOM	Employment, Unemployment	Unemployment rate [% of labour force]		...	X					
	7.02	ECONOM	Employment, Unemployment	Unemployment rates by country and regional extremes (5th CR)		...	X					
	7.02	ECONOM	Employment, Unemployment	Young people aged 15–24 not in work,education or training (5th CR)		...	X					
	7.02	ECONOM	Employment, Unemployment	Youth unemployment rate		...	X					
	7.02	ECONOM	Employment, Unemployment	Employment and productivity by sector		e, w	X					
	7.02	ECONOM	Employment, Unemployment	Employment per economic activity		...						
	7.02	ECONOM	Employment, Unemployment	Total number of employees by sector		...						
	7.02	ECONOM	Employment, Unemployment	Employment communting from / to FUAs		...						
	7.02	ECONOM	Employment, Unemployment	Employment in the transport sector as % of total employment		e						
	7.02	ECONOM	Employment, Unemployment	Employment rate per year		...						
	7.02	ECONOM	Employment, Unemployment	Employment ratio of female to male rates at country level, worldwide		...						
	7.02	ECONOM	Employment, Unemployment	Unemployment rate by level, worldwide of education at country level,		...						
	7.03	ECONOM	Income and Consumption	GDP per employee		...						
	7.03	ECONOM	Income and Consumption	GDP per economic activity		...						
	7.03	ECONOM	Income and Consumption	Total household income		...						
	7.03	ECONOM	Income and Consumption	Level of income		...						
	7.03	ECONOM	Income and Consumption	Coefficient of variation of GDP per capita		...						
	7.03	ECONOM	Income and Consumption	GDP smoothing at 40-50 km		...						
	7.03	ECONOM	Income and Consumption	Dispersion of GDP per head, EU-15 NUTS 2 regions (5th CR)		...	X					
	7.03	ECONOM	Income and Consumption	Growth rate of GDP in PPS per capita		...						
	7.03	ECONOM	Income and Consumption	Regional GDP per inhabitant		...						

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					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	7.03	ECONOM	Income and Consumption	Income distribution in quintiles		...						
	7.03	ECONOM	Income and Consumption	Wages and salary		...						
	7.03	ECONOM	Income and Consumption	Intra-regional income dispersion		...						
	7.03	ECONOM	Income and Consumption	Share of total trade in GDP at country level, worldwide		...						
	7.03	ECONOM	Income and Consumption	Total trade in merchandise and services (imports and exports) at country		...						
	7.03	ECONOM	Income and Consumption	GNI per capita based on purchasing power parity (PPP) at country level,		...						
	7.03	ECONOM	Income and Consumption	Growth of GDP per head in real terms		...	X					
	7.03	ECONOM	Income and Consumption	NAFTA:GDP per head (USDPPS)		...	X					
	7.03	ECONOM	Income and Consumption	Net adjusted disposable income of private households (PPCS)		...	X					
	7.03	ECONOM	Income and Consumption	Russia, India, China and Brazil: Regional GDP per head		...	X					
	7.03	ECONOM	Income and Consumption	Western Balkans:GDP per head (PPS)		...	X					
	7.03	ECONOM	Income and Consumption	Regional Index of Sustainable Economic Well-being and gross value-		...	X					
	7.03	ECONOM	Income and Consumption	Sources of economic growth		...	X					
	7.03	ECONOM	Income and Consumption	GDP per region		...						
	7.03	ECONOM	Income and Consumption	GDP per economic sector		...						
	~~7.03~~	~~ECONOM~~	~~Income and Consumption~~	~~Gross Domestic Product (per region)~~		w						
	7.03	ECONOM	Income and Consumption	Gross capital formation (% of GDP) at country level, worldwide		...						
	7.03	ECONOM	Income and Consumption	GNP per inhabitant		...						
	7.03	ECONOM	Income and Consumption	Regional GVA (billions of euros, 2000 base year)		...						
	7.04	ECONOM	Investments, Finances and Expe	Location of China's investments		...						
	7.04	ECONOM	Investments, Finances and Expe	Money flows on various levels		...						
	7.04	ECONOM	Investments, Finances and Expe	Taxation		...						
	7.04	ECONOM	Investments, Finances and Expe	Access to venture-capital		...						
	7.04	ECONOM	Investments, Finances and Expe	Green investments		...						
	7.04	ECONOM	Investments, Finances and Expe	Annual enterprise and innovation spending		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Balance of net FDI inflows and outflows		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Change in expenditure and revenue of sub-national levels of government		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Change in public investment compared to change in total public		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Estimated public investment per head (PPS)		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Net effect of taxes and public transfers		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Net personal remittances		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Public expenditure by administrative level in the EU		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Public expenditure by broad COFOG categories in the EU		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Public expenditure by policy area		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Public expenditure on environmental protection as share of GDP and per		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Public expenditure on transport, communications and energy as a share of		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Sub-national public expenditure as a share of GDP in 2009 and change		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Sub-national public investment as a share of total public investment		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Total public expenditure as a share of GDP		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Total public expenditure per head in PPS		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Total public investment per head in PPS		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Fiscal stimulus by area relative to GDP		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Public investment as a share of GDP in Cohesion and non-Cohesion		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Public investment per head in PPS by type of region		...	X					
	7.04	ECONOM	Investments, Finances and Expe	6th Framework Programme,average funding per head (5th CR)		i	X					
	7.04	ECONOM	Investments, Finances and Expe	A comparison of the growth rates of Objective 1 and other regions (5th		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Aid intensity of ERDF,Cfand ISPA by urban-rural typology ofregions in the		...	X					

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	7.04	ECONOM	Investments, Finances and Expe	CAP Pillar 1 – EAGF expenditure per UAA (5th CR)		i	X					
	7.04	ECONOM	Investments, Finances and Expe	CAP Pillar 2– EAFRD expenditure per head (5th CR)		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Cohesion Policy expenditure relative to GDP (5th CR)		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Cohesion Policy spending by main theme (5th CR)		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Cumulative net effect of Cohesion Policy on GDP—longterm gains in		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Distribution of Funds by Objective (5th CR)		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Estimated impact of Cohesion Policy expenditure on GDP (5th CR)		i=>w	X					
	7.04	ECONOM	Investments, Finances and Expe	Estimated impact of investment grants per employee (5th CR)		i=>?	X					
	7.04	ECONOM	Investments, Finances and Expe	Estimated Impact of R&D grants per employee (5th CR)		i=>?	X					
	7.04	ECONOM	Investments, Finances and Expe	Impact of Cohesion Policy in each country: cumulative effect on GDP (5th		io=>w	X					
	7.04	ECONOM	Investments, Finances and Expe	Impact of Cohesion Policy in each country: cumulative effect on		io=>w	X					
	7.04	ECONOM	Investments, Finances and Expe	Less-Favoured Areas (PROPORTION TO ALL OF AREAS) (5th CR)		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Planned Cohesion Policy expenditure on transport (5th CR)		i	X					
	7.04	ECONOM	Investments, Finances and Expe	Planned investments of Cohesion Policy in environment (5th CR)		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Planned investments of Cohesion Policy in RTD,innovation,enterprise		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Planned investments of Cohesion Policy in transport infrastructure (5th		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Sectoral breakdown of EIB support to Cohesion Policy (5th CR)		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Share of ERDF and Cohesion Fund in total public investment (5th CR)		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Share of main beneficiary Member States in total exports of net donor		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Total EIB support to Cohesion Policy 1 (amount signed) (5th CR)		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Foreign Direct Investments in reporting economies (inward and outward)		...						
	7.04	ECONOM	Investments, Finances and Expe	Planned investments of Cohesion Policy in human capital, 2007–2013 (5th		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Private investment per head (PPS)		...	X					
	7.04	ECONOM	Investments, Finances and Expe	Productivity growth within sectors		e	X					
	7.05	ECONOM	Industry, Services	Specialisation of region's economy		...						
	7.05	ECONOM	Industry, Services	Trade between EU15 and EU12		...	X					
	7.05	ECONOM	Industry, Services	Trade in goods relative to GDP EU-27		...	X					
	7.05	ECONOM	Industry, Services	Trade in services relative to GDP EU-27		...	X					
	7.05	ECONOM	Industry, Services	Exports and imports to other EU Member States		...	X					
	7.05	ECONOM	Industry, Services	Share of administration, education, health and social services in the		...						
	7.05	ECONOM	Industry, Services	Share of financial and business services in the regional added value		...						
	7.05	ECONOM	Industry, Services	Share of technological manufacturing industries in the regional added		...						
	7.06	ECONOM	Tourism	Turnover in tourism sector		...						
	7.06	ECONOM	Tourism	No. of tourist bed places		...						
	7.06	ECONOM	Tourism	No. of nights spent		...						
	7.06	ECONOM	Tourism ????	No. of hospital days		...						
	7.06	ECONOM	Tourism	Number of non-resident visits to a region [Tourism?]		...						
	7.06	ECONOM	Tourism	Number of non-resident visits to a region		...						
	7.07	ECONOM	Innovation	Patent applications to the EPO by priority year at the regional level, total		...						
	7.07	ECONOM	Innovation	Number of start-ups		...						
	7.07	ECONOM	Innovation	Regional innovation performance index, from European Regional		...						
	7.07	ECONOM	Innovation	Co-patenting (OCDE)		...						
	7.07	ECONOM	Innovation	Telecommunication uptake		...						
	7.07	ECONOM	Innovation	R&D BES personnel (in fte) per 1000 active person 2002 rsp. last year		...						
	7.07	ECONOM	Innovation	R&D BES, Total personnel (in fte) per 1000 active person		...						
	7.07	ECONOM	Innovation	R&D BES personnel		...						
	7.07	ECONOM	Innovation	Innovation and eco-innovation pilot and market replication projects		...						

Annex 2. Inventory of indicators (presented at the ESPON MC meeting in Budapest, 23 June 2011)

Inidicator level	Thematic sub-cat. nr	Thematic category name	Thematic sub-category name	Indicator name	Criteria for selection							
						Policy evaluation framework	Policy documents					
					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	7.07	ECONOM	Innovation	Investment in ICT (especially for SME)		...						
	7.07	ECONOM	Innovation	Economic specialisation (in advanced service activities, R&D, high		...						
	7.07	ECONOM	Innovation	Effect of support for research		...	X					
	7.07	ECONOM	Innovation	Households with broadband connection (5th CR)		...	X					
	7.07	ECONOM	Innovation	Households with broadband internert by degree of urbanisation (5th CR)		...	X					
	7.07	ECONOM	Innovation	Increase in household broadband connections (5th CR)		...	X					
	7.07	ECONOM	Innovation	Patent applications to the European Patent Office (EPO)		...	X	X				
	7.07	ECONOM	Innovation	Regional Innovation Performance Index (5th CR)		...	X					
	7.07	ECONOM	Innovation	Regional innovation potential (5th CR)		...	X					
	7.07	ECONOM	Innovation	Total expenditure on R&D (5th CR)		i	X					
	7.07	ECONOM	Innovation	Availability and use of e-Governement services (5th CR)		e	X					
	7.07	ECONOM	Innovation	Employment in technology and knowledge intensive sectors by gender		...		X				
	7.07	ECONOM	Innovation	% of households having access to the internet at home		...		X				
	7.07	ECONOM	Innovation	Human resources in science and technology		...						
	7.07	ECONOM	Innovation	Research & Development Expenditures		i						
	7.07	ECONOM	Innovation	Expenditures, R&D, all institutional sectors, in %		i						
	7.07	ECONOM	Innovation	Expenditures in RDI as total of GDP		i						
	7.08	ECONOM	Business, all sectors	Market sizes		...						
	7.08	ECONOM	Business, all sectors	Location of business		...						
	7.08	ECONOM	Business, all sectors	International headquarters		...						
	7.08	ECONOM	Business, all sectors	Cluster size		...						
	7.08	ECONOM	Business, all sectors	Cluster specialization		...						
	7.08	ECONOM	Business, all sectors	Number of firms by sector of operation (2 digits)		...						
	7.08	ECONOM	Business, all sectors	Number of Small and Medium size Enterprises		...						
	7.08	ECONOM	Business, all sectors	Number of Creation and transfer of enterprises		...						
	7.08	ECONOM	Business, all sectors	Economic diversification of rural areas		...						
	7.08	ECONOM	Business, all sectors	Local economic activities (fishing, tourism, etc)		...						
	7.08	ECONOM	Business, all sectors	Number of companies created		...						
		ENVIRONMENT QUALITY, NATURAL AS		Application of environmentas norms/standards		...						
		ENVIRONMENT QUALITY, NATURAL AS		Food-miles		...						
	8.01	ENVIRON	Environment quality	Emissions of Acidifying Substances Acidifying Potential		...						
	8.01	ENVIRON	Environment quality	Fragmentation by urbanisation, infrastructure and agriculture		...						
	8.01	ENVIRON	Environment quality	Wastes management (private, public, transboundary, etc)		...						
	8.01	ENVIRON	Environment quality	Noise disturbance - noise level		...						
	8.01	ENVIRON	Environment quality	Noise disturbance - exposure to excessive noise (nb of people exposed)		...						
	8.01	ENVIRON	Environment quality	Nutrients in coastal water		...						
	8.01	ENVIRON	Environment quality	Coastal erosion		...						
	8.01	ENVIRON	Environment quality	Coastal zone with Natura 2000		...						
	8.01	ENVIRON	Environment quality	Municipal waste production		e						
	8.01	ENVIRON	Environment quality	Municipal waste treatment		...						
	8.01	ENVIRON	Environment quality	% of residents exposed to various source of noises		...						
	8.01	ENVIRON	Environment quality	Landslides		...						
	8.01	ENVIRON	Environment quality	Environmental services		...						
	8.01	ENVIRON	Environment quality	Main sources of investment in water, waste water and solid waste		...	X					
	8.01	ENVIRON	Environment quality	Environmental quality		...						
	8.01	ENVIRON	Environment quality	- green infrastructure		...						
	8.01	ENVIRON	Environment quality	Coverage of protected areas		...						

Annex 2. Inventory of indicators (presented at the ESPON MC meeting in Budapest, 23 June 2011)

Inidicator level	Thematic sub-cat. nr	Thematic category name	Thematic sub-category name	Indicator name	Criteria for selection							
						Policy evaluation framework	Policy documents					
					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	8.02	ENVIRON	Natural assets	Share of different types of forest		...						
	8.02	ENVIRON	Natural assets	Landscape - area of housing		...						
	8.02	ENVIRON	Natural assets	Landscape - visual attractiveness		...						
	8.02	ENVIRON	Natural assets	Landscape - cultural heritage (agric landscapes)		...						
	8.02	ENVIRON	Natural assets	Transboundary water management		...						
	8.02	ENVIRON	Natural assets	Change of bio mass		...						
	8.02	ENVIRON	Natural assets	Basins		...						
	8.02	ENVIRON	Natural assets	Share of Agricultural Land under Organic Farming		...						
	8.02	ENVIRON	Natural assets	Share of sensitive ecoregions		...						
	8.02	ENVIRON	Natural assets	Statuts of marine fish stocks		...						
	8.02	ENVIRON	Natural assets	Drinking water quality		...						
	8.02	ENVIRON	Natural assets	Classified naturalness		...						
	8.02	ENVIRON	Natural assets	Proximity to natural areas (combined indicator)		...						
	8.02	ENVIRON	Natural assets	Renewable freshwater resources per capita at country level, worldwide		w						
	8.02	ENVIRON	Natural assets	Water Exploitation Index		...						
	8.03	ENVIRON	Climate change	Attitudes / public info on climate change		...						
	8.03	ENVIRON	Climate change	Change of the average annual number (amount) of days with heavyn		...						
	8.03	ENVIRON	Climate change	Settlement prone to heavy rainfall / sea level rise		...						
	8.03	ENVIRON	Climate change	Exposure to climate change of the agriculture, fisheries and tourism sector		...						
	8.03	ENVIRON	Climate change	% of population in coastal areas prone to sea level rise / heavy rainfall		...						
	8.03	ENVIRON	Climate change	Sea surface temperature per year		...						
	8.03	ENVIRON	Climate change	Extreme temperature		...						
	8.03	ENVIRON	Climate change	Number of days of rain per year		...						
	8.03	ENVIRON	Climate change	Chemical plants		...						
	8.03	ENVIRON	Climate change	Avalance data		...						
	8.03	ENVIRON	Climate change	Mean max, min annual temperature		...						
	8.03	ENVIRON	Climate change	Number of frost days per year		...						
	8.03	ENVIRON	Climate change	Average precipitation per year in kg/sqm		...						
	8.03	ENVIRON	Climate change	Vehicle emissions		...						
	8.03	ENVIRON	Climate change	Changes in sea level rise		...						
	8.03	ENVIRON	Climate change	Change of the average precipitation		...						
	8.03	ENVIRON	Climate change	Ozone concentration exceedances in cities (5th C.R.)		...	X					
	8.03	ENVIRON	Climate change	CO2 Emissions, intensity, per capita		...						
	8.03	ENVIRON	Climate change	CO2 emissions per usable land		...						
	8.03	ENVIRON	Climate change	Concentration of particulate matter (PM10) at surface level (5th C.R.)		...	X					
	8.03	ENVIRON	Climate change	Change in greenhouse gas emissions in the EU (5th C.R.)		...	X					
	8.03	ENVIRON	Climate change	Total greenhouse gas emissions, EU-12 (5th C.R.)		...	X					
	8.03	ENVIRON	Climate change	Total greenhouse gas emissions, EU-15 (5th C.R.)		...	X					
	8.03	ENVIRON	Climate change	Projected change in annual number of days with snow cover between		...	X					
	8.03	ENVIRON	Climate change	Soil sealed area (5th C.R.)		...	X					
	8.03	ENVIRON	Climate change	Projected change in number of tropical nights (5th C. R.)		...	X					
	8.04	ENVIRON	Risks, hazards	Number of all volcanoes in NUTS2 area		...						
	8.04	ENVIRON	Risks, hazards	Soil Erosion		...						
	8.04	ENVIRON	Risks, hazards	Exposure of ecosystems to acidification, eutrophication and ozone		...						
	8.04	ENVIRON	Risks, hazards	Sum of all weighted hazard values classicied in 5 categories		...						
	8.04	ENVIRON	Risks, hazards	Sum of the vulnerability indicators		...						
	8.04	ENVIRON	Risks, hazards	Prevention of natural risks		...						

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Inidicator level	Thematic sub-cat. nr	Thematic category name	Thematic sub-category name	Indicator name		Criteria for selection						
						Policy evaluation framework	Policy documents					
					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	8.04	ENVIRON	Risks, hazards	Frequency of hazards/disasters		...						
	8.04	ENVIRON	Risks, hazards	Protection against floods & unusual risks		...						
	8.04	ENVIRON	Risks, Hazards	Dry spell		...						
	8.04	ENVIRON	Risks, Hazards	Droughts		...						
	8.04	ENVIRON	Risks, Hazards	Earthquakes		...						
	8.04	ENVIRON	Risks, Hazards	Floods		...						
	8.04	ENVIRON	Risks, Hazards	Floods in urban areas		...						
	8.04	ENVIRON	Risks, hazards	Oil hazards		...						
	8.04	ENVIRON	Risks, hazards	UNESCO world heritage areas prone to heavy rainfall / sea level		...						
	8.04	ENVIRON	Risks, hazards	Forest fires		...						
	8.04	ENVIRON	Risks, hazards	Storms,tsunami		...						
	8.04	ENVIRON	Risks, hazards	Biogeographic regions		...						
	8.04	ENVIRON	Risks, hazards	Evolution of natural surfaces		...						
	8.04	ENVIRON	Risks, hazards	Oil Hazards - average of 3 standardized hazard indicators (harbours,		...						
	8.04	ENVIRON	Risks, hazards	Change of dry spell combination with drought		...						
	8.04	ENVIRON	Risks, hazards	Classified natural hazards		...						
	8.04	ENVIRON	Risks, hazards	Classified technological hazards		...						
	8.04	ENVIRON	Risks, hazards	Artificialisation of coast		...						
	8.04	ENVIRON	Risks, hazards	Areas at risk of soil erosion (ton/ha/year)*(5% of areas with farms <10ha /		...						
	8.04	ENVIRON	Risks, hazards	Flood endangered settlement and artifical areas		...						
	8.04	ENVIRON	Risks, Hazards	Risk from sea level rising		...						
	9.01	GOVERN	Governance	Number of project co-operations		...						
	9.01	GOVERN	Governance	Effectiveness of public administration (4th C.R)		...						
	9.01	GOVERN	Governance	Existence of a national adaptation strategy		...						
	9.01	GOVERN	Governance	Corruption		...						
	9.01	GOVERN	Governance	Good use of money		...						
	9.01	GOVERN	Governance	International cooperation and its added value (esp. for border areas)		...						
	9.01	GOVERN	Governance	Relative rurality		...						
	9.01	GOVERN	Governance	Number of local units		...						
	9.01	GOVERN	Governance	Way in which roles and responsabilities are distributed among the different		...						
	9.01	GOVERN	Governance	Way in which roles and responsabilities are distributed among local		...						
	9.01	GOVERN	Governance	Describes the related processes of negotiation and consensus building		...						
	9.01	GOVERN	Governance	Public attitudes towards the political-administrative system		...						
	9.01	GOVERN	Governance	Shift from government to governance		...						
	9.01	GOVERN	Governance	Decentralisation		...						
	9.01	GOVERN	Governance	Voice and accountability		...						
	9.01	GOVERN	Governance	Political stability and absence of violence		...						
	9.01	GOVERN	Governance	Government effectiveness		...						
	9.01	GOVERN	Governance	Regulatory quality		...						
	9.01	GOVERN	Governance	Rule of law		...						
	9.01	GOVERN	Governance	Control of corruption		...						
	9.01	GOVERN	Governance	Public Private Partnership		...						
	9.01	GOVERN	Governance	Twinning		...						
	9.01	GOVERN	Governance	Inter municipal cooperation		...						
	9.01	GOVERN	Governance	Trans-national and interregional cooperation		...						
	9.01	GOVERN	Governance	Cooperation between cities of small/medium size at internal and external		...						
	9.01	GOVERN	Governance	Capacity to conclude agreements (interregional, transnational, cross-		...						

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Inidicator level	Thematic sub-cat. nr	Thematic category name	Thematic sub-category name	Indicator name		Criteria for selection						
						Policy evaluation framework	Policy documents					
					Top	input, output, effect, impact on well-being	5th Cohesion report	Lisbon strategy	Gothenburg strategy	Sustainble Development Stragey	Regions 2020 (EC, 2008)	Europe 2020
	9.01	GOVERN	Governance	Government effectiveness index		...						
	99.01	NON - CR	Integrative indices and typologie	Share of Internet users to100 inhabs regression		...						
	99.01	NON - CR	Integrative indices and typologie	Attractiveness (to be detailed) - citizen's perspective on other regions		...						
	99.01	NON - CR	Integrative indices and typologie	Comparative price levels of final consumption by private households		...		X				
	99.01	NON - CR	Integrative indices and typologie	Urban-rural typology including remoteness		...	X					
	99.01	NON - CR	Integrative indices and typologie	Urban-rural typology including remoteness (NAFTA)		...	X					
	99.01	NON - CR	Integrative indices and typologie	Business investment: gross fixed capital formation by private sector as a		...		X				
	99.01	NON - CR	Integrative indices and typologie	Human Capital Intensity (HCI)		e						
	99.01	NON - CR	Integrative indices and typologie	Intensity of multiple risks (challenges) for European Regions		w					X	
	99.01	NON - CR	Integrative indices and typologie	Classified Lisbon performance		...						
	99.02	NON - CR	Geographical objects	Generation of PIAs- x iteration		...						
	99.02	NON - CR	Geographical objects	Area assigned to the PUSH using the % criterion		...						
	99.02	NON - CR	Geographical objects	Extent of 45 min isochrones		...						
	99.02	NON - CR	Geographical objects	Settlement structure assignment		...						
	99.02	NON - CR	Geographical objects	Urban influence		...						
	99.02	NON - CR	Geographical objects	Distance to settlement areas		...						

Annex 3. Top indicators - data availability

Territorial objectives	Indicators	NUTS level	Years available
Strong local economies ensuring global competitiveness	Labour productivity in industry and services	NUTS 2	2007
	Labour productivity per person employed	NUTS 0	1995-2010
	GDP per capita in PPS	NUTS 3	1997-2008
	Overall unemployment rate	NUTS 3	1999-2009
	Old age dependency ratio	NUTS 3	2000-2010
Innovative territories	Population aged 25-64 with tertiary education	NUTS 2	2008-2010
	Intramural expenditures on R&D	NUTS 2	2007
	Employment rate 20-64	NUTS 2	1999-2009
Fair access to services, market and jobs	Access to compulsory school	NUTS 0, degree of urbanisation	2008
	Access to hospitals	NUTS 0, degree of urbanisation	2008
	Accessibility of grocery services	NUTS 0, degree of urbanisation	2007
	Access to university	(SILC data)	2007
	Accessibility potential by road	NUTS 3	2001, 2006
	Accessibility potential by rail	NUTS 3	2001, 2006
	Accessibility potential by air	NUTS 3	2001, 2006
Inclusion and quality of life	Disposable household income	NUTS 2	1996-2007
	Life expectancy at birth	NUTS 2	2000-2008
	Proportion of early school leavers	NUTS 1	2000-2010
	Gender imbalances	NUTS 3	2000-2009
	Difference in female-male unemployment rates	NUTS 2	1999-2010
	Ageing index	NUTS 3	2000-2010
Attractive regions of high ecological values and strong territorial capital	Potential vulnerability to climate change	NUTS 3	2011
	Air pollution: PM_{10}	NUTS 3	2009
	Air pollution: Ozone concentrations	NUTS 3	2008
	Soil sealing per capita	NUTS 3	2006
Integrated polycentric territorial development	Population potential within 50 km	NUTS 3	2008
	Net migration rate	NUTS 3	2007
	Cooperation intensity	NUTS 2	2008
	Cooperation degree	NUTS 2	2008

Annex 4. INTERCO Indicators at Global Level

Inventory of indicators in the global level (available all at NUTS 0)

Territorial Objectives	INTERCO Top Indicators	Equivalent indicators at the Global level	Unit	Year or period covered	Source	Other: Data Description / Gaps
Strong local economies ensuring global competitiveness	Labour productivity in industry and services	Labour productivity growth (only for OECD countries) **	% growth/ change	2000-2009 **	OECD	** Only OECD countries. Labour productivity is defined as GDP per hour worked. The measures of labour productivity are presented as rates of change.
		GDP per person employed **	PPP	1991-2008 **	World Bank	** Data not available for half of countries. GDP per person employed is gross domestic product (GDP) divided by total employment in the economy. PPP is GDP converted to constant international dollars using PPP rates. An international dollar has the same purchasing power over GDP that a U.S. dollar has in the United States.
	GDP per capita in PPP	GDP per capita in PPP	PPP	1991-2010	World Bank	GDP per capita based on purchasing power parity (PPP). Not available for all countries
	Unemployment rate	Unemployment Rate **	per cent	2009	UNDP - HDR 2009, 2010 based on ILO and OECD	** Incomplete data from ILO in time series. Calculations for 2009 and harmonised figures for this year only compiled by the United Nations HDR Report 2009.
		Unemployment rate by level of education **	per cent	2009-2010	UNDP - HDR 2009, 2010 based on ILO and OECD	** Incomplete data from ILO in time series. Calculations for 2009 and harmonised figures for this year only compiled by the United Nations HDR Report 2009.
	Old age dependency ratio	Old age dependency ratio	Old age ratio	1990 & 2009	UNDP - HDR 2009	Data on old age dependency helps identifying increases or decreases in labour force

Innovative territories	Population 25-64 with tertiary education	Tertiary-level gross enrolment ratio	per cent	Period varies	UN and UNESCO	Tertiary-level gross enrolment ratio and Women's share of third level enrolment (%)
	Intramural expenditures on R&D	GERD as % of GDP **	% of GDP	1996-2009	UNESCO	** Data from UNESCO: not available for a considerable (half) number of countries.
		Public expenditure as % of GDP in R&D **	% of GDP	2000-2007	UNDP HDR ´10	** Data from UNDP HDR 2010: compiled data for the latest year available for the period 2000-2007. One-year-data.
	Employment rate 20- 64	Employment indicators	Diverse	1999-2008	ILO Laborsta Database	Employment general, employment by economic activity, by occupation, by status in employment

Fair access to services, market and jobs	Access to university	Enrolment ratios in secondary and tertiary education **	gross ratio	2001-2009	UNESCO and UNDP – HDR 2010	** Data refer to the most recent year available during the period specified; compiled by UN HDR Report.
	Accessibility potential by road	Travel time to major cities: A global map of Accessibility	grid format	2000	European Commission Joint Research Centre	Estimated travel time to the nearest city of 50,000 or more people in year 2000. Global Environment Monitoring Unit - Joint Research Centre of the European Commission, Ispra Italy. Available at http://bioval.jrc.ec.europa.eu/products/gam/
	Accessibility potential by rail					
	Accessibility potential by car					
	Access to hospitals	:	:	:	:	:
	Accessibility to grocery services	:	:	:	:	:
	Access to compulsory school	:	:	:	:	:

Inclusion and quality of life	Disposable household income	GINI coefficient of income disparities **	GINI coefficient	2009, 2010 **	World Bank / UNDP - HDR 2010	** Incomplete data for time series but harmonised figures for the period 2000-2010 compiled by the United Nations HDR Report corresponding to the latest available figure during this period. The Gini index lies between 0 and 100. A value of 0 represents absolute equality and 100 absolute inequality and measures the degree of inequality in the distribution of income in a given society.
	Life expectancy at birh	Life expectancy at birth	years	1996-2010	World Bank	Life expectancy at birth indicates the number of years a new-born infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.
	Proportion of early school leavers	Children out of school	persons	1999-2009**	UNESCO at World Bank	** Data incomplete for a number of countries. Number of primary-school-age children not enrolled in primary or secondary school by males and females
	Gender imbalances	% of women by level of education	per cent	1999-2010	UNESCO	School age population in primary, secondary and tertiary level
		Employment: ratio of female to male rates **	ratio	2000-2008	UNDP - HDR 2010 based on ILO data	** Data refer to the most recent year available during the period specified. Compilation of figures by the United Nations HDR Report 2010. Data not available for all countries
	Different female-male unemployment rate	Employment: ratio of female to male rates **	ratio	2000-2008	UNDP - HDR 2010 based on ILO data	** Data refer to the most recent year available during the period specified. Compilation of figures by the United Nations HDR Report 2010. Data not available for all countries
	Ageing index	Old age dependency ratio	ratio	1990 & 2009	UNDP - HDR 2009	Data on old age dependency helps identifying increases or decreases in labour force

Attractive regions of high ecological values and strong territorial capital	Air pollution	Global CO2 emissions (metric tons per capita) per country	metric tons per capita	1990-2009	World Bank	Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring.
		Greenhouse Gas Emissions and/or GHG emissions per capita	mio. tonnes of CO2 equivalent	1994-2008 **	UN Framework Convention on Climate Change (UNFCCC)	** Data refer to the most recent year available during the period specified. Compilation of figures by UN. One year-data
	Biodiversity	Global biodiversity Indicators	several indicators	:	UNEP - Biodiversity Indicators Partnership	Biodiversity Indicators Partnership launched by the United Nations Environment Programme - A compilation of 17 indicators available at http://www.twentyten.net/
	Renewable energy potential	Renewable electricity production	billion kilowatt hours	1998-2008	EIA Database	Last update: EIA database accessed march 2011
		Share of renewable generation in respect to total electricity generation	% of total electricity	1998-2008	EIA Database	Last update: EIA database accessed march 2011
	Potential vulnerability to climate change (ESPON Climate)	:	:	:	:	:
	Soil sealing per capita	:	:	:	:	:
	Mortality, hazards and risks	:	:	:	:	:

Integrated polycentric territorial development	Population potential within 50 km	Population density	inhab/km2	1981-2010	World Bank	Midyear population divided by land area in square kilometres. Population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, which are generally considered part of the population of their country of origin.
	Net migration rate	Net migration rate	rate	1960-2010	World Bank	Data are five-year estimates. To derive estimates of net migration, the United Nations Population Division takes into account the past migration history of a country or area, the migration policy of a country, and the influx of refugees in recent periods.
	Cooperation intensity from ESPON TERCO	:	:	:	:	:
	Cooperation degree from ESPON TERCO	:	:	:	:	:
	Polycentricity index	:	:	:	:	:

The ESPON 2013 Programme

INTERCO

Indicators of Territorial Cohesion

Scientific Platform and Tools Project 2013/3/2

Annex 5

Sydsverige & Eastern Denmark

(Sweden and Denmark)

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EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

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Figures, maps and tables

Objectives

The objective of the INTERCO case studies is to locally explore the headline indicators defined in the framework of the project as a way to characterize local situations.

The analysis of the feasible indicators is intended to show that higher spatial inequalities are revealed when going beyond the traditional NUTS 3 level of study. Territories which seem to have certain level of spatial disparities in the traditional NUTS-3 level of analysis might register other degrees of disparities/inequalities at a local level. The idea is to observe if the analyses at LAU level bring important new insights regarding TC patterns at NUTS 3 level as well as differences between them.

Additionally to this it is of interest to identify indicators available in the local case-studies that do not exist at the EU regional level but that might be of interest for the other levels in the framework of Territorial Cohesion.

Summarising, the main objective is to create awareness of the existence of another spatial layer/level of study additional (and complementary) to the traditional NUTS 2-3 scales, where more complex spatial patterns exist but seem to be imperceptible in the traditional way of displaying indicators on the basis of these regional scales.

1. Case study introduction

1.1. General Features

This case study area is constituted by the cross border regions of Sydsverige in Sweden and Sjælland and Hovedstaden in Denmark. Sydsverige is located in the southernmost extreme of Sweden, sharing the strait of Öresund with the Danish island of Zealand where the Copenhagen Capital City Region is located. Both sides of the strait share historical, geographical and economical backgrounds which nowadays constitute a major example of a cross border cooperation region in the Nordic context.

The case study covers both rural peripheral sparsely populated areas as well as important urban agglomerations such as Stor-Malmö (Greater Malmö) and Storkøbenhavn (Metropolitan Copenhagen) which together constitute one of the most densely populated areas in the Nordic Countries.

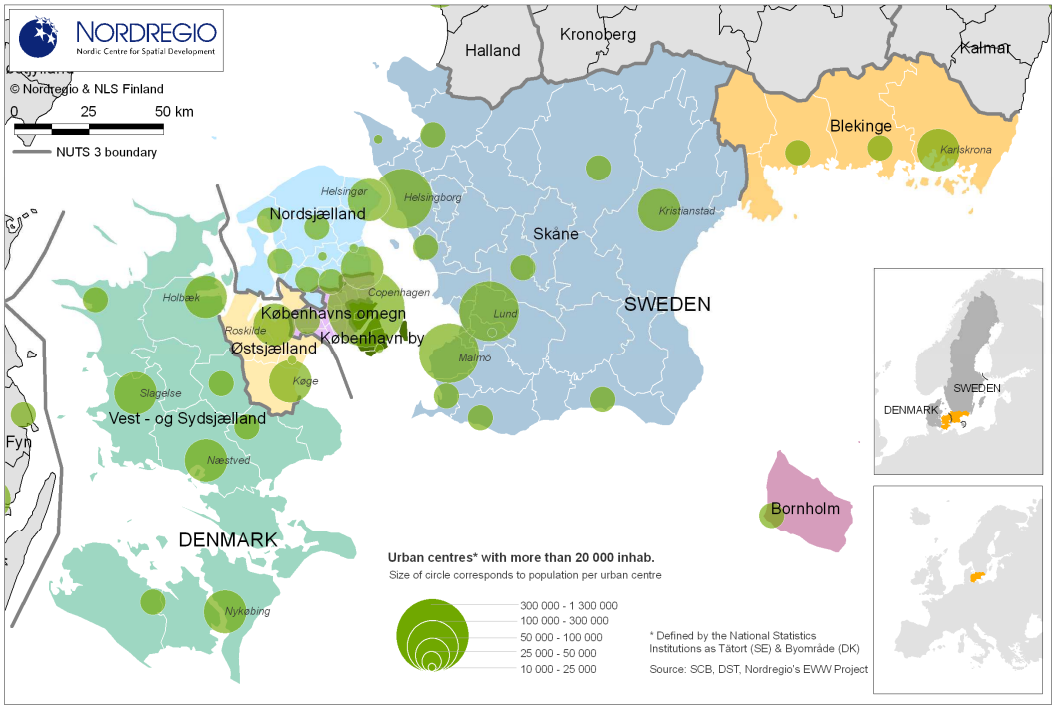
From a geographic point of view the case study area is dominated by plain areas with little elevation and no mountain areas. The Danish side is consisted by islands including Zealand (where Copenhagen is located) Lolland, Falster and Møn located in the southern periphery of the case study. The island of Bornholm is located east of the rest of Denmark. In Sydsverige, region Skåne is dominated by open, non mountainous landscapes differing from the traditional densely forested and lake-rich landscape of the rest of Sweden. Areas covered with forests in Sydsverige are only found in the northern parts of Skåne, as well as areas next to the Linderödsåsen -a minor ridge that stretches from the north-west to the south-east- and region Blekinge which is almost entirely covered by forest and a large amount of water bodies.

The largest settlements are found along the coasts of the Öresund Strait (see map 1) which is also the geographical centre of the case study. Copenhagen is the capital city of Denmark and Greater Copenhagen is the largest urban agglomeration of the country including municipalities and satellites cities around the municipalities of Copenhagen and Frederiksberg with a population of more than 1,8 inhabitants. *Stor-Malmö* or Greater Malmö is one of the 3 *storstadsregioner* or metropolitan areas of Sweden according to the latest official regional divisions of the country[1] gathering 12 municipalities and about 655,000 in population. Apart from Greater Copenhagen and Greater Malmö other significant urban areas in the case study includes Helsingborg and Lund (over 100 000 inhab.) followed by Roskilde, Næstved, Kristianstad, Slagelse (between 70-80 000 inhab.) and Karlskrona, Holbæk, Nykøbing and Helsingör (between 60-70 000 inhab.). Areas with relatively low population densities are located in the north and east of Sydsverige and on the north-west and south-west peripheries of the Danish side.

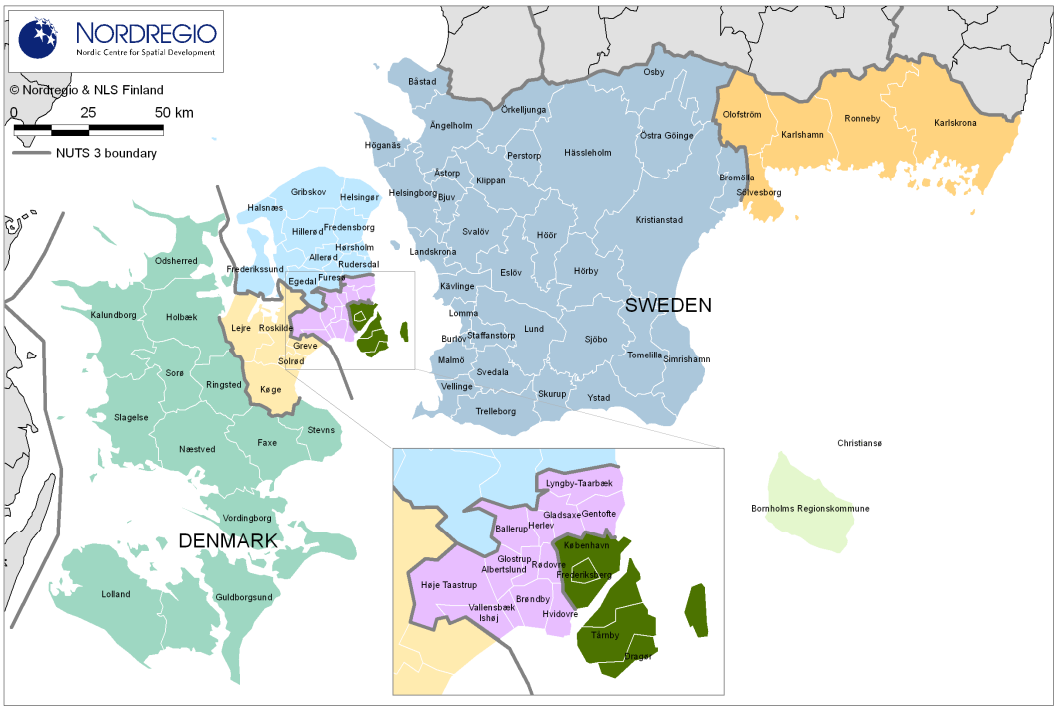
The case study area is then composed by regions in two different Nordic countries, sharing both a national capital region, and a major urban region like Malmö-Lund. But it also includes rural and/or peripheral areas in eastern and southern Skåne, Blekinge and southern and western parts of Zealand, Lolland, Falster and Bornholm which altogether have many similarities as they have low population densities and they benefit from wide expanses of nature. These characteristics create a typical spatial core-periphery

[1] SCB (2011): Regional divisions in Sweden on 1 january 2011, Statistics Sweden, 2011

structure that brings together a number of disparities between local sub-regions as it will be shown later in this study.



Map 1: NUTS 3-LAU borders and major urban centres in Sydsverige-Eastern Denmark



Map 2: LAU (municipalities) in in Sydsverige-Eastern Denmark

1.2. NUTS/LAU level classification

Sweden is divided into 21 NUTS 3 regions which correspond to LAU level 1 units, and a total of 290 municipalities which correspond to LAU level 2 units. Sydsverige on its own covers the NUTS-3 regions/LAU-1 units of Skåne and Blekinge and contains 38 municipalities or LAU-2 units, 5 of them in Blekinge and 33 in Skåne.

Denmark on the other hand is divided into 11 NUTS 3 regions called *Landsdeler* and a total national of 99 municipalities which correspond to the LAU level 1. Region Sjælland or Zealand and Region Hovedstaden or Capital City are part of the Öresund Region. There are 6 Danish NUTS-3 regions in this case study: Byen København, Københavns omegn, Bornholm (which altogether form the NUTS 2 region Hovedstaden) as well as Nordsjælland, Sjælland, Østsjælland and Vest- og Sydsjælland (which altogether form the NUTS 2 region Sjælland) gathering 47 municipalities.

Altogether the case study consists of 8 different NUTS 3 regions (2 in Sweden, 6 in Denmark) and 85 municipalities (38 in Sweden, 47 in Denmark, see map 2) with a total area of 23 800 km2 and a total population of 3,884,448 as of 2010[2]

To produce a homogenous analysis this case study will take the local level as the municipal level which corresponds to LAU-1 in Denmark and LAU-2 in Sweden.

Table 1: Top largest and smallest LAU by population in Sydsverige-Eastern Denmark

Top 10 largest LAU by population in the case study

LAU name	NUTS 3	NUTS 2	Population 2010	Area	Density
København	København by	Region Hovedstaden	**528 208**	88	5 985
Malmö	Skåne län	Sydsverige	**293 909**	154	1 913
Helsingborg	Skåne län	Sydsverige	**128 359**	346	371
Lund	Skåne län	Sydsverige	**109 147**	431	253
Frederiksberg	København by	Region Hovedstaden	**96 718**	9	11 028
Roskilde	Østsjælland	Region Sjælland	**81 947**	212	387
Næstved	Vest- og Sydsjælland	Region Sjælland	**81 112**	684	119
Kristianstad	Skåne län	Sydsverige	**78 788**	1 250	63
Slagelse	Vest- og Sydsjælland	Region Sjælland	**77 475**	250	310
Gentofte	Københavns omegn	Region Hovedstaden	**71 052**	26	2 782

Top 10 smallest LAU by population in the case study

LAU name	NUTS 3	NUTS 2	Population 2010	Area	Density
Christiansø	Bornholm	Region Hovedstaden	**101**	0,22	459
Perstorp	Skåne län	Sydsverige	**6 983**	160	44
Örkelljunga	Skåne län	Sydsverige	**9 639**	322	30
Bromölla	Skåne län	Sydsverige	**12 285**	165	75
Osby	Skåne län	Sydsverige	**12 656**	578	22
Tomelilla	Skåne län	Sydsverige	**12 936**	399	32
Olofström	Blekinge län	Sydsverige	**13 102**	392	33
Svalöv	Skåne län	Sydsverige	**13 290**	390	34
Östra Göinge	Skåne län	Sydsverige	**13 526**	434	31
Dragør	København by	Region Hovedstaden	**13 564**	18	748

Source: National Statistics Institutions

[2] Compiled figures taken from Statistics Denmark and Statistics Sweden.

1.3. An accessible regional example of innovative research, higher education and cross border cooperation

The case study area is a leader in promoting innovative research in several areas of technological development by creating a network between the many actors concentrated in the region (firms, research laboratories, universities, knowledge based industries, etc) where in particular universities and high education institutions have a major role in keeping and promoting a research platform specialised on a number of high-tech fields such as medical/pharmaceutical, bio-technology, IT, telecommunications, software, design, food processing and environmental technologies. Thanks to this, the region has appropriate conditions for cluster creation in any of these fields: an example here is Medicon Valley, Europe's leading cluster within the life science area, and an attractive place to find business partners. The region is also home to the largest concentration of highly educated people in the Nordic countries and hosts a well-developed working relationship between industry, higher education establishments and the authorities. (OECD, 2003; 2006) The case study area is then a major example of a region focused on knowledge-base as one of the main pillars for regional development.

It also hosts the Öresund Region, an important example of cross border cooperation. Since 1993, local, regional and national authorities have been cooperating in a regional policy forum called the Öresund Committee and the Öresund Region constituted for several years the Interreg II and III Programmes in the strand A (cross border cooperation). Regions in the case study are currently part of three of the EU Cohesion Policy 2007-2013 Cross Border Programmes under the European Territorial Cooperation Objective (Öresund-Kattegatt–Skagerrak, South Baltic and Sjælland-Ostholstein-Lübeck-Plön)

All in all, the case study is interestingly located as it acts as a gateway to the Nordic markets and gets benefited from the proximity to northern Germany, Poland and Balticum. Transport infrastructures include Copenhagen airport, one of the largest in Norden combined with regional airports in Malmö, Ängelholm-Helsingborg, Kristianstad and Ronneby and also major ports such as Copenhagen, Malmö, and Helsingborg, which participate in the Baltic Ports Organisation Ferry connections across the Baltic Sea operate from several smaller ports as well. The Baltic Sea and the Öresund strait remain one of the busiest routes in the world, including also strategic routes for oil shipping.

Investments after the construction of the Öresund Bridge increased drastically accessibility across both sides of the case study. Travel times between the two shores of the Öresund Strait were no longer than those between Copenhagen and one of its suburbs. Daily cross-border commuters multiplied from 2 000 at the opening of the bridge (2000) up to 10 000 after 5 years. Other important infrastructure projects include a new railway to Copenhagen International Airport, a new metro in Copenhagen, and several highway projects in Skåne. These investments have turned the Öresund Region into a major logistic hub in Europe.[3]

[3] OECD (2006): Øresund Science Region: A cross-border partnership between Denmark and Sweden, Garlic S. etl al, June 2006

2. Data availability in the case study

The different Headline indicators of the Interco project have been examined in terms of data availability at LAU levels for this case study. The methodology to define Headline Indicators in Interco was included in the Interim Report but here there is a summary of it:

Definition of the different categories of indicators in INTERCO

INTERCO approaches territorial indicators differently from the ESPON Database as it focuses on territorial cohesion ones. It considered the following 5 categories of indicators -see the Note on the criteria for the thematic selection of indicators (sent to ESPON CU on 11.5.2011) complementing the Interim Report- :

1. **Synthetic/composite (headline) indicators**, i.e. the simplification of several indicators into one single index summarising all the underlying dimensions of the issues and policies at stake (8 indicators);

2. **Headline indicators**, i.e. a limited number of indicators that have the highest explanatory power and the highest relevance for the issues and policies at stake;

3. **Core indicators**: these indicators complement the headline indicators in the analysis of the main issues and policy objectives -see in detail in the above mentioned Note.

4. **Analytical indicators**, i.e. a full set of indicators that provide additional insights for the issues and policies at stake;

5. **Other data** (that may once become indicators under different circumstances, i.e. if issues of interest or policy objectives are modified).

The TPG decided to focus on the headline and core indicators for the entire ESPON space. Interco headline indicators are those with the highest explanatory power and highest relevance for the issues and policies at stake, but its feasibility at LAU level is restricted and therefore its selection depends on the data availability.

The results in Sydsverige-East DK show some coincidence with other case studies regarding the difficulties of finding available and comprehensive data at LAU level. The lack of a standardized database like Eurostat for the LAU level makes difficult the process of collection and harmonisation of data at this level. Limitations were found especially when looking for INTERCO headline indicators at a local level associated to thematic sub-categories on health, energy, poverty, environment, quality of life and governance categories. However other headline indicators in the sub-categories of population, employment and education were feasible to be included in the analysis.

Indicators were found across Sweden's and Denmark's National Statistics Institutions, National Employment Offices, National Institutes of Public Health and Ørestat (a local statistical institution supported by the national statistics institutions of Sweden and Denmark).

This exemplifies another constraint when locating and collecting data at LAU level since often it is necessary to track indicators among several sources in each individual country.

The selected set of relevant and comprehensive indicators calculated for this case study includes employment rate, unemployment rate, ageing index, population growth, tertiary level educated population and population density. Additionally indicators such as GDP, average disposable income and life expectancy are also included in the set as it was possible to find some data below the NUTS 3, however with some restrictions that will be explained in each section. When it comes to GDP it was possible to find data at FUA level from the ESPON FUA's Database 2013 corresponding to GDP in million of euro and GDP per inhabitant in thousands euro. Income data was found at Ørestat and life expectancy averages data were found at LAU level at the Public National Heath Institutes of Sweden and Denmark, but the different periods of time used to measure the average in each country established a difficulty when comparing results. In these indicators we tried also to exemplify local situations that might exist between different areas in the case study based on observations made in the Nordic context.

The rest of Interco Headline indicators represented a challenge when trying to find data at LAU level and therefore could not be included in this analysis because of the lack of publicly available or comprehensive data at LAU level.

Table 2 displays the list of Interco Headline Indicators and its availability (marked with green) at LAU level in the case study area Sydsverige – Eastern Denmark.

Table 2: Interco Headline indicators; data availability in Sydsverige-Eastern Denmark

Headline Indicator name	Availability Sydsverige - East DK	Observation
Ageing index (persons 65+ / persons 0-14)	**+**	
Dependency rate	**+**	
Life expectancy at birth	**+***	*Differentces between periods of time measured (between countries)*
Population potential within 5 km		
Population average annual growth	**+**	
Share of renewable energy in final energy consumption and increase needed to meet the 20% target		
Population aged 30–34 with a tertiary education in 2008 and distance to Europe 2020 target		
Share of tertiary educated people in %	**+***	*Difference in categorizations of tertiary level categories between SE and DK. Available data is not standardized so harmonised for 1year only.*
Healthy life expectancy (ESPON 3.2)		
Self-perceived personal state of health in EU Member States		
At persistent risk of poverty rate (Population share with 60 % of the national equivalent median income)		
Share of population living in workless or low work intensity households (5th CR)		
Work-life balance in EU Member States (5th CR)		
Happiness Index		
Share of population reporting crime, violence or vandalism by degree of urbanisation (5th CR)		
Difference between female and male employment rates, 20–64	*	
Employment rate change (growth) = employment rate, single year	**+***	*Only 1 year data calculated. LFS adjusted series.National Employment Officesdata only.*
Unemployment rate per age: classes of 5 years = Unemployment rate, single year	**+***	*No data found per classes of 5 years. Only 1year data calculated. LFS adjusted series.National Employment Officesdata only.*
Development of unemployment rate (male, female, young, total, 99-04)		
GDP per inhabitant (capita) in PPS or Euros, per year = GDP per inhab and million EUR	**+***	*Data available at FUA level. From ESPON FUA s Database. Data includes GDP in million of euro and GDP per inhabitant in euro. Does not include all LAUs*
GDP change per inhabitant (capita) in PPS or Euros	:	
Median disposable annual household income	**+***	*Data from Örestat who is keen to warn about comparing data between countries due to difference in tax systems.*
Public sector debt relative to GDP		
NATURA 2000 area (Share of Natura 2000 area in %)		
Consumption of water per capita		
Electoral participation	*	*Available but not calculated = Definitions vary between countries*
Voice and accountability		
Population density (Core Indicator)	**+**	

3. Analysis of territorial cohesion on the basis of feasible headline indicators

3.1. Competitiveness

3.1.1. GDP

Figures of GDP per capita in PPS at LAU level are unavailable for the case study area. However, from the ESPON Database 2013 it was possible to find GDP in million of euro and GDP per inhabitant in thousands euro per FUA. However not all LAUs in the case study are were included in the analysis since the Functional Urban Areas database excludes those LAUs not belonging to FUAs.

Economic performance, measured as GDP per capita in purchasing power standards (PPS), provides an indication of the value of all market and some non-market goods and services produced within a region. The adjustment to local price differences shows the ability of countries and regions to succeed in the global scenario. The level of production, in turn, sets the sustainable level of prosperity that can be earned by an economy.

One measure of the economic potential of the case study area is that about 1/4 of Denmark's and Sweden's total GDP comes from it. In 2007, the Danish side of the case study accounted for 48% of Denmark's total GDP (the Capital Region of Copenhagen alone accounted for 37% and Region Zealand for 11%) whereas Skåne's GDP represented 12% of the Swedish GDP (13% when also Blekinge is included in the NUTS 2 Sydsverige). This reveals the difference of the regions' significance in their national economies and the significance of major urban areas (such as Hovedstaden) in the regional economy of the case study.

As observed in the Nordic countries[4], the capital region is performing best in terms of GDP per capita, followed by other metropolitan regions and industrial areas.

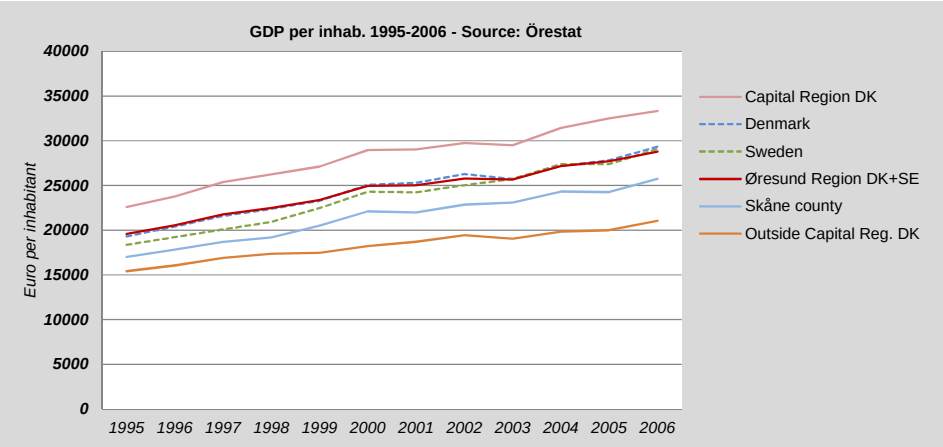


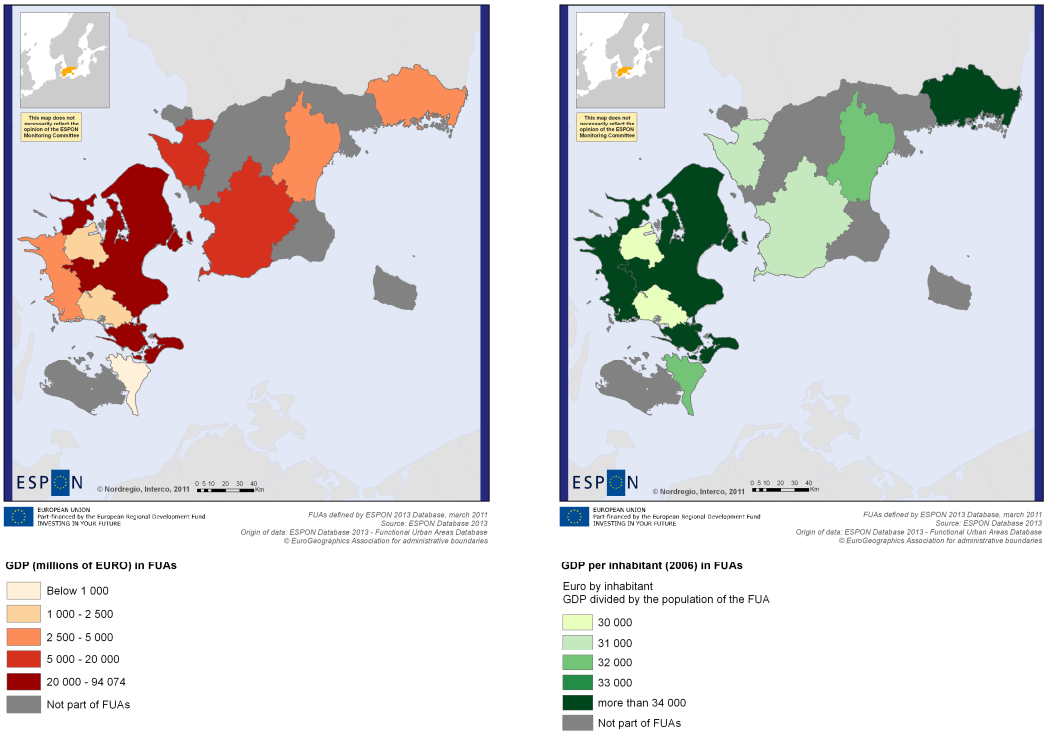
Figure 1: GDP (euro per inhabitant) development in Sydsverige-Eastern Denmark 1995-2006.

[4] Observations taken from the study "Regional Development in the Nordic Countries 2010", Nordregio

Local GDP values primarily in LAUs in Copenhagen might register therefore the highest figures in the case study followed by regional centres. On the other hand, the lowest scores in the Nordic countries are often found in primary production dominated rural regions. This might be the case of some LAUs in southern Zealand, Blekinge (except Karlskrona) and south-western and northern Skåne as well as Bornholm.

It was also observed that in Denmark and, to a lesser extent, Sweden, poorly performing regions in terms of GDP are also found near capital or major urban regions. In these regions, mainly residential, there are no, or very few, industries and a significant share of the population is out-commuting to other regions where the production of goods and services actually takes place. Local examples of this nature might exist in LAUs around the hinterland of Greater Copenhagen and/or Greater Malmö.

Maps 3 A) and B) shows indicators on GDP at FUA level[5] found in the ESPON 2013 Database for Functional Urban Areas. The picture gets broader than at a regional level. However the functional urban areas database excludes LAUs not belonging to FUAs which in this case study coincides with peripheral rural sparsely populated areas. However from map 3 A) and B) it is possible to confirm some of the Nordic patterns described before: GDP is indeed higher in areas around Copenhagen and figures gets lower in FUAs containing a number of sparsely populated LAU units and/or LAUs distant from main urban areas or regional centres.



Map 3 A) GDP (millions of euro) in FUAs and 3 B) GDP per inhabitant (euro per inhab.) in Sydsverige-Eastern Denmark 2006

[5] ESPON 2013 Database Technical report, march 2011: The Functional Urban Areas Database

3.1.2. Unemployment

Despite the remarkable upswing after the economic crisis of the 1990s, where a substantial number of jobs were created in the Nordic labour markets, the global financial crisis of the late 2000s resulted in a new increase in unemployment rates in all countries. In Denmark, the unemployment rate almost doubled between 2008 (3.3%) and 2009 (6.0%), though it still remains below the EU27 average while in Sweden, the level has fluctuated over the last three years. In Sweden, more or less all regions experienced an increase in unemployment after the crisis. In Denmark, after a long period of falling unemployment which reached the lowest level of recent times in the middle of 2008, rates began to increase and kept climbing throughout 2009. As Sweden has been relatively more affected by higher unemployment than Denmark, regions and LAUs in the Swedish side of the case study register therefore higher rates. (Figure 2)

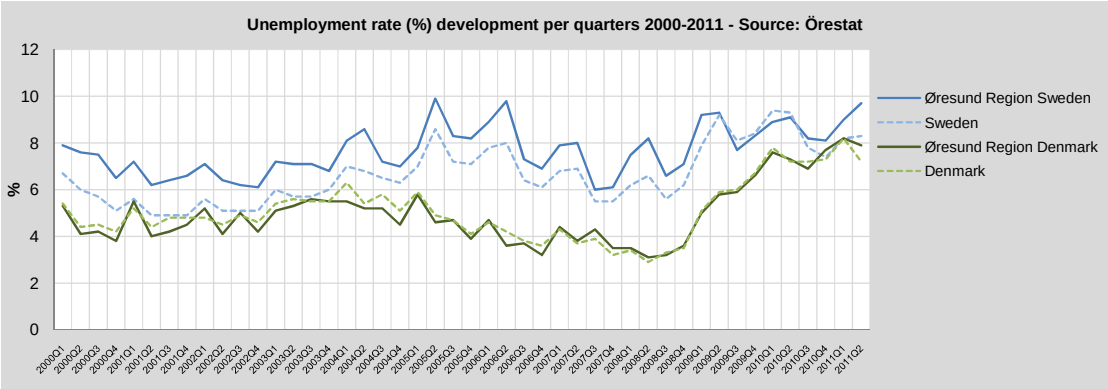
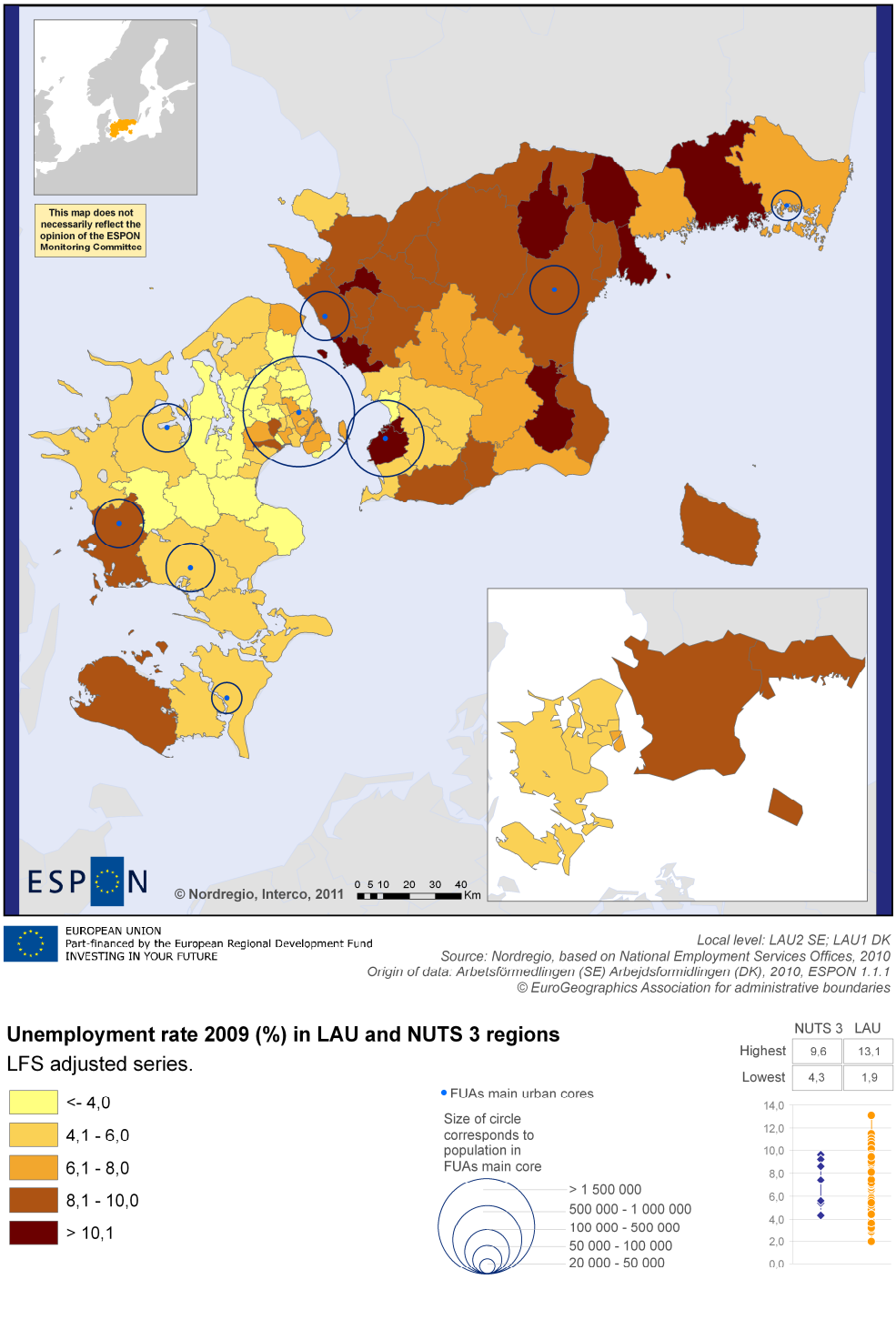


Figure 2: Unemployment in the Öresund Region in % and in total number of unemployed

By analysing the case study from the NUTS 3 level, it is possible to find highest percentages associated to Swedish regions and Bornholm where rates are around 9-10%. In contrast, lowest shares at a NUTS 3 level correspond to Danish regions such as Ostsjælland and Nordsjælland where figures are around 4%. The variation between the eight NUTS 3 regions span between 4,3% and 9,6% which contrasts to a larger variation between the 85 LAU units that span between 1,9% and 13,1% (Figure 6).

As unemployment is higher in Sweden, a larger number of LAUs with highest rates (more than 10%) are located in Skåne-Blekinge. Here a particular local situation is identified in LAUs characterised by low population (below 20-30,000 inhab.) and increasing ageing population which register high unemployment rates. LAU examples includes Tomelilla (10,1) and Östra Göinge (10,8) in Skåne and Sölvesborg (11,1) and Olofström (11,5) in Blekinge, a traditional manufacturing area which happens to be a peripheral region at national and case study levels. These local examples with a less prosperous development are those that tend to be characterised by an old-fashioned industrial structure based on manufacturing and natural resources-based industries.

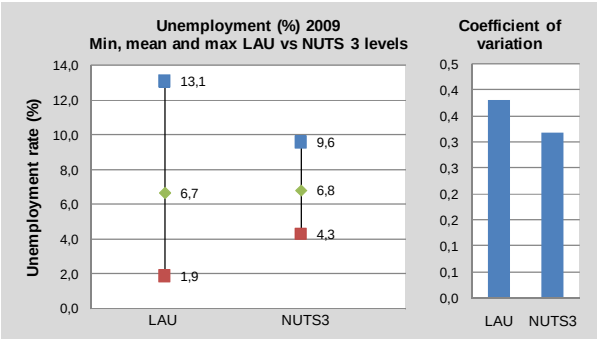


Map 4: Unemployment rate (%) in Sydsverige-Eastern Denmark, 2009

A similar local situation is also found in the Danish side, however this time including a non-central region such as Vest- og Sydsjælland (5,6) and two peripheral municipalities Slagelse (9,1) and especially Lolland (8,8) -dark brown areas to the left of map 4- where the relatively moderate regional unemployment rate does not reflect local examples with critical unemployment rates. The labour supply in these areas often simply does not possess all the qualities demanded by modern industries in central regions.

However local areas in industrialised central regions also experience high unemployment rates seen from a local point of view. So by looking at map 4 it can be seen that high unemployment rates are not exclusively found in peripheral areas far from the geographical centre of the case study (the Öresund Strait) but local examples of high unemployment also include LAUs in Greater Malmö and Greater Copenhagen. For example the NUTS 3 region of Københavns omegn registers an unemployment rate of 5,4% which seems relatively modest; but when going deeper into the local level it is possible to find nearby municipalities to Copenhagen with rates well above the regional rate such as Ishøj (9,5) or Albertslund (9,2). The situation is the same for the Greater Malmö area where central LAU areas such as Burlöv (10,6) and Landskrona (13,1) also register figures above the regional rate (8,2).

When comparing statistically the results given by NUTS 3 and LAU levels in general, the situation shown in figure 3 illustrate that maximum and minimum values for unemployment rates differ considerably among the LAU level and the NUTS 3 level.



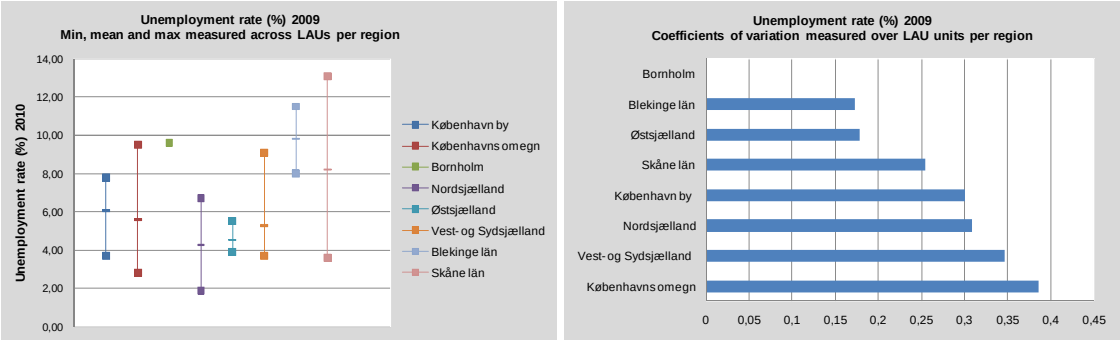
Source: National Employment Offices of Sweden and Denmark

Figure 3: Max. min, standard deviation and coefficient variation of unemployment rates (%) in 2009 between NUTS3 and LAU levels

While in the NUTS 3 level the highest figure register 9,6% it goes up to 13,1% in the LAU level. The analysis at a local level is able then to visualise the gap/disparities between those municipalities with figures higher than 9,6% (11 municipalities) and those under 4,3% (18 municipalities). The figure also shows a bigger coefficient of variation along the LAU level. This implies that the range of results is larger and therefore the level of complexity of the indicator at a local level is broader.

Figure 4 shows the disparities between LAU units per NUTS 3 region. The figure shows the maximum, average and minimum figures registered by LAU units in each of the eight NUTS 3 regions of the case study. The coefficients of variation confirms local situations previously explained where higher disparities exist not only between peripheral/remote

and central areas (LAUs in Vest- og Sydsjælland) but also among LAU areas in regions around Greater Copenhagen (Figure 4 to the right) which register the highest levels of disparities in the case study as figures here include both some of the highest and lowest unemployment rates.



Source: National Employment Offices of Sweden and Denmark

Figure 4: Unemployment rate (%) 2009 disparities measured across LAUs within the regions and coefficients of variation

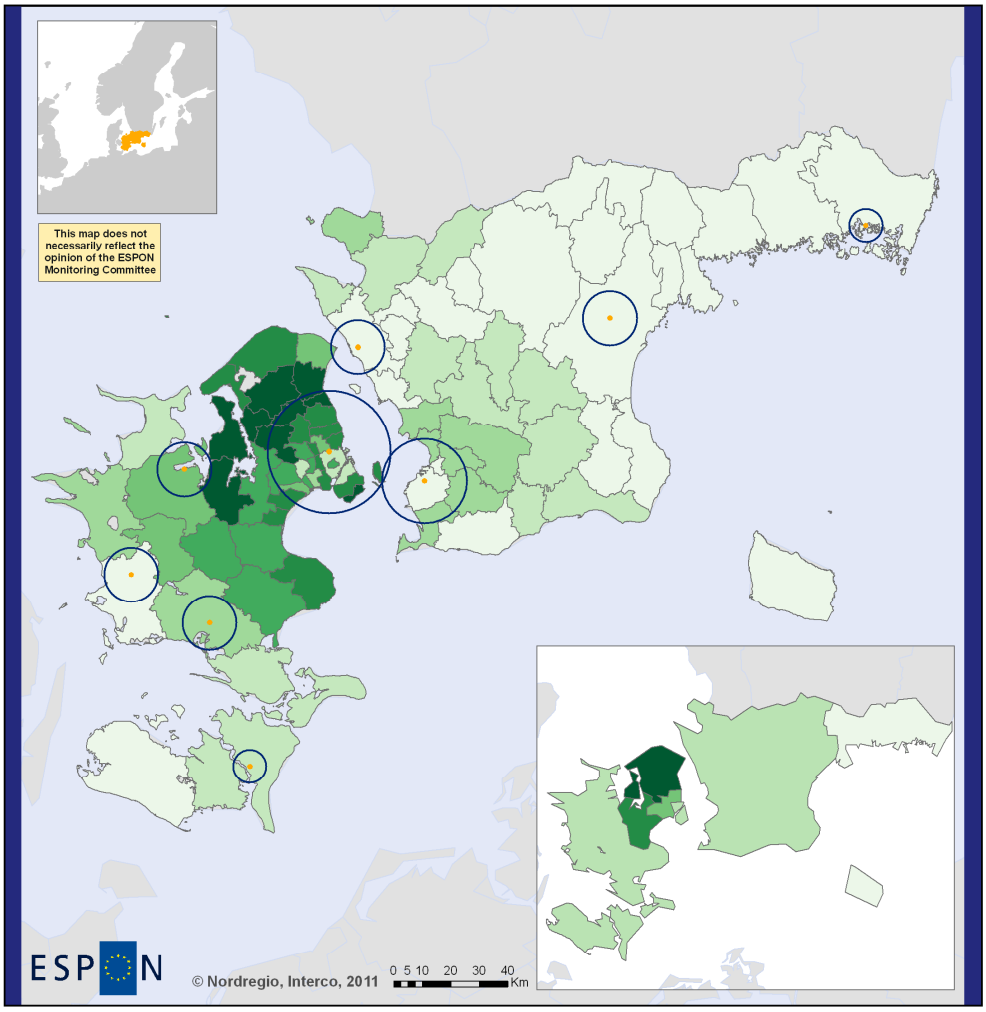
3.1.3. Employment

In general terms employment rates are higher in the Danish side of the region and in some local examples in Sweden (Lomma, Vellinge and Lund). By analysing the case study from the NUTS 3 level it is possible to find the highest rates associated to regions in Denmark in the hinterland of the Capital Region such as Nordsjælland and Østsjælland where rates are above 80%.

In contrast, the lowest shares at a NUTS 3 level correspond to peripheral areas such as Bornholm and Blekinge where figures are around 71%. The variation between the eight NUTS 3 regions span between 71,1% and 82,6% which contrasts to a much larger variation between the 85 LAU units that span between 66,3% and 87,3% (Figure 5).

The analysis of the case study at a local level gives new inputs to these figures. At the local level, 36 out of 85 LAU in the case study have employment rates above the average and 22 LAUs all located in Denmark register rates above 80%. The majority of these LAU units are located around densely populated areas and/or areas with large population such as Greater-Copenhagen (Map 5). The situation in the Swedish side where figures are slightly lower shows higher employment rates located along the Öresund Strait, the area with the highest concentration of population in Skåne.

The lowest employment rates can be found in peripheral sparsely populated local examples with relatively far from large urban areas. That is the case of Bornholm, different LAUs especially in eastern and southern peripheral Vest- og Sydsjælland, and LAUs close to the border between Blekinge and Skåne and the whole of Blekinge.



Map 5: Employment rate (%)in Sydsverige-Eastern Denmark, 2009

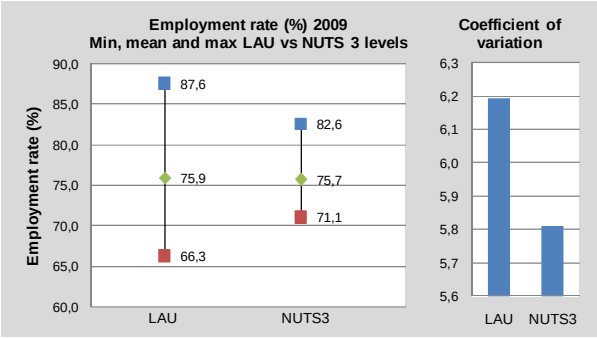


Figure 5: Max. min, standard deviation and coefficient variation of employment rates (%) in 2009 between NUTS3 and LAU levels

When analysing figures at the local level it is possible to find additional patterns: lowest rates are not exclusively associated to peripheral areas but are also found around major urban areas. Examples of LAUs below the average are found in municipalities such as Albertsund, Brøndby and København itself, as well as Malmö and Helsingborg. This shows that LAUs in areas around major urban areas register high local contrasts as they have both some of the highest and lowest figures in the case study. Figure 6 shows the evidence of such disparities in Kobenhavn by and Nordsjælland. However the highest disparities among LAUs within a region are found in Vest- og Sydsjælland which has the lowest rate in the case study in contrast with relatively high rates LAUs closer to Greater Copenhagen.

At the same time the average NUTS 2-3 figures can't reflect exceptional local examples such as Egedal, Allerød, Frederikssund or Dragør, all of them in Denmark with shares above 84% and up to 87,6% constituting some of the highest employment rates in the Nordic Countries. This is an example of notable local examples difficult to underline from NUTS 2-3 figures.

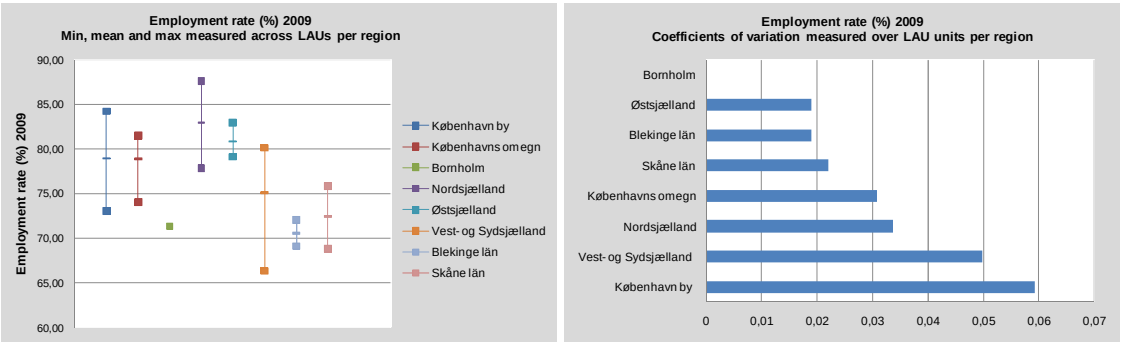


Figure 6: Employment rate (%) 2009 disparities measured across LAUs within the regions and coefficients of variation

3.2. Inclusion

3.2.1. Population with tertiary education

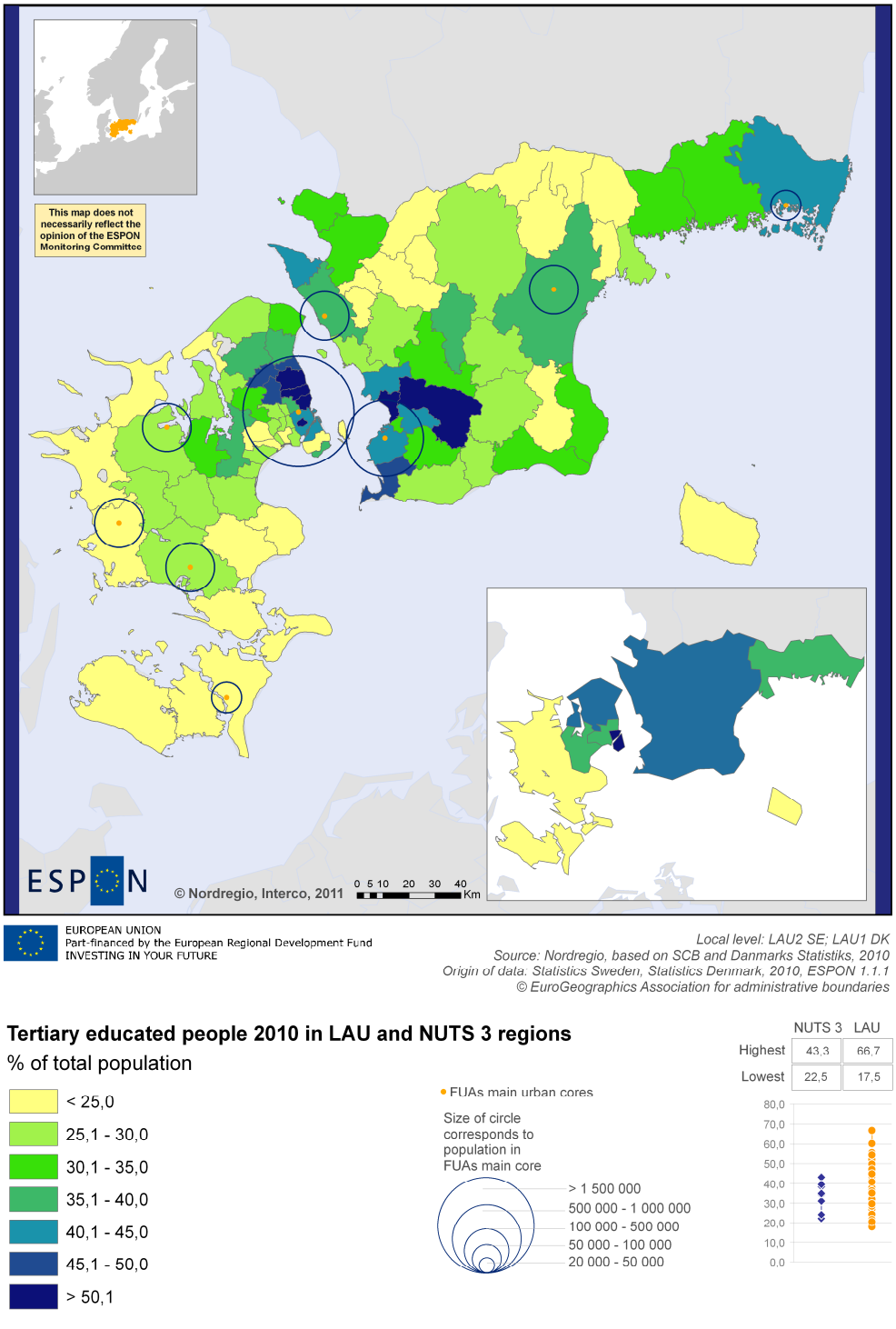
An important asset for the Nordic labour market is its highly skilled labour force. All the Nordic Countries have higher share of tertiary educated persons than in EU on average (22 %) referring to persons with semi-long (bachelor level) and long (master's and PhD-level) higher education. On regional level, the regions with highest levels of population with a tertiary education in Europe can be found in the Nordic Countries.

On average 31,9% of the population aged 25 years or more in the case study area has a tertiary level education which is above the national averages for both Denmark and Sweden.

By analysing the case study from the NUTS 3 level it is possible to find the highest percentages associated to regions with large populations such as Københavns by and Skåne where rates are around 40%. In contrast, the lowest shares at a NUTS 3 level correspond to peripheral areas such as Bornholm and Vest- og Sydsjælland where figures are around 20%. The variation between the eight NUTS 3 regions span between 22,5% and 43% which contrasts to a much larger variation between the 85 LAU units that span between 17,5% and 66,7% (Figure 7).

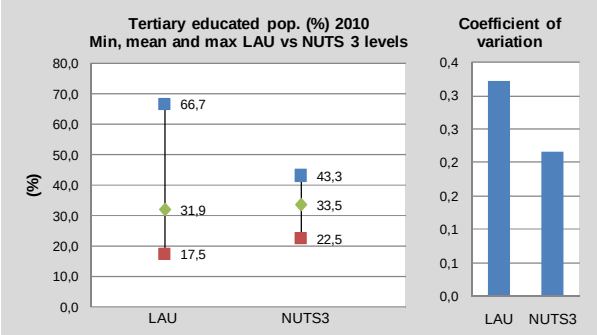
Analysing the case study area from the local level gives new inputs to regional results. At the local level, 33 out of 85 LAU in the case study have shares above the case study average of 31,9%. The majority of these LAU units are located around densely populated areas and/or areas with large population such as Greater-Malmö or Greater-Copenhagen (Map 6). These major urban areas are often home to a number of high education institutions and thus create a spatial influence over surrounding local areas which are characterised by small size in terms of area and populations around 50-60,000 or below. At the local level also the regional centres with universities and other higher education institutions can be highlighted. That is the case of Lund (66,7%), Karlskrona (41,9%) and Roskilde (38%). Universities work then as instruments of local and regional development through specific initiatives, through education, research and cooperation with the surrounding society.

The lowest rates can be found in peripheral sparsely populated local examples with limited education possibilities relatively far from regional university centres or large urban areas. That is the case of different LAUs especially in eastern and southern peripheral Vest- og Sydsjælland, Bornholm, and LAUs close to the border between Blekinge and Skåne as well as northern Skåne.



Map 6: Tertiary educated people (%)in Sydsverige-Eastern Denmark, 2010

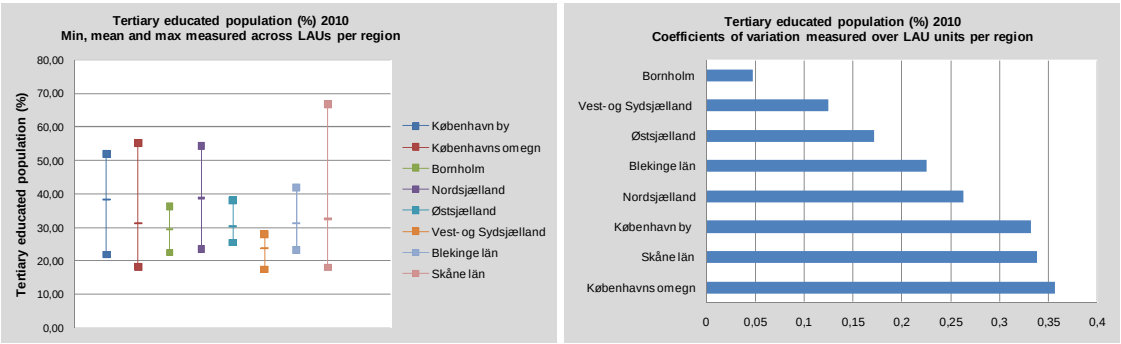
When going deeper into the local level it is possible to find additional patterns: lowest shares of tertiary educated population are not exclusively associated to peripheral areas but are also found around major urban areas. Four local examples (Ishøj, Brøndby Tårnby and Høje-Taastrup located in the heart of the Capital Region of Copenhagen register some of the lowest shares of the case study (below 24%) which might be explained by the fact that all these LAU have income levels below the average of the Danish side. LAU in areas around major urban areas register high local contrasts as they have both some of the highest and lowest figures in the case study.



Source: National Statistical Offices of Sweden and Denmark

Figure 7: Max, min, standard deviation and coefficient of variation of tertiary educated people in 2010 between NUTS 3 and LAU level

At the same time the average NUTS 2-3 figures can't reflect exceptional local examples such as Lund, Lomma (Skåne), Getofte, Lyngby-Taarbæk (Københavns omegn) and Rudersdal & Hørsholm (Nordsjælland) all of them with shares above 50% up to 66,7% well above other LAU examples within their regions. These examples constitute some of the highest local shares of tertiary educated population in the Nordic Countries, probably in Europe. This is an example of remarkable local examples difficult to highlight from NUTS 2-3 figures.



Source: National Statistical Offices of Sweden and Denmark

Figure 8: Tertiary educated pop (2010) disparities measured across LAUs within the regions and coefficients of variation

A major issue here was the difference in categorizations of tertiary level categories between Sweden and Denmark. Data was harmonised and calculated for one year only since it is not standardized between both countries.

3.2.2. Ageing Index

Ageing population is a pattern that has been affecting various regions across the Nordic Countries. Compared to the EU27 average, the age group 60-64 years is significantly larger in the Nordic countries while the age groups 20-54 years are slightly smaller. In contrast, the share of children aged 0-19 years is higher in Norden than in the EU, which means that relatively large age groups are not only currently exiting but also entering Norden's labour markets.

A common trend in the case study area is that the population in urban areas is younger, while in rural and sparsely populated local areas the population is older. Many of the peripheral and sparsely populated areas can be characterised as small economies facing demographic challenges. The ageing population is often explained by low fertility levels, higher average life expectancy and the out-migration of young people that aggravates the problem and creates depopulation and other related problems. At the same time, some of the larger urban regions are struggling to develop an approach to the provision of sustainable living conditions, for example in relation to access to housing and the provision of adequate communication infrastructures.

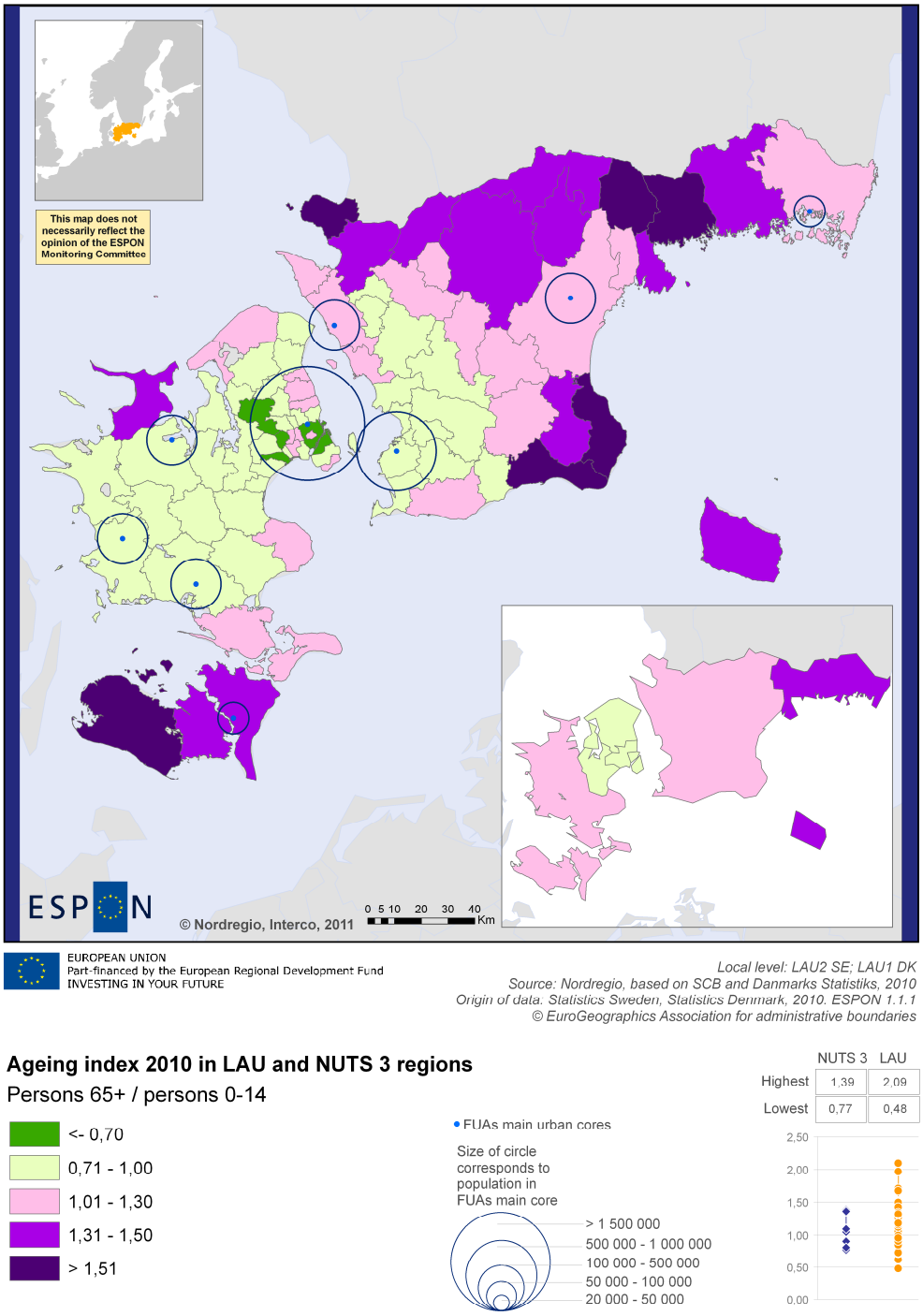
Specifically in map 7 it is possible to find some of these major urban local areas around the Öresund Strait (the central areas of the case study) with lower ageing indexes[6] than those registered in LAUs in peripheral areas. LAUs in Skåne are clearly divided into two different halves: the west containing major cities and largest industrial activity is characterised by low ageing index in contrast to the westernmost remote and peripheral regions characterised by old population and out migration patterns. This regional east-west divide situation is only perceptible when Skåne is analysed at a local level.

A similar situation is presented in Vest- og Sydsjælland where the indicator figures at the local level shows a clear regional divide, in this case north-south, between its different LAU units.

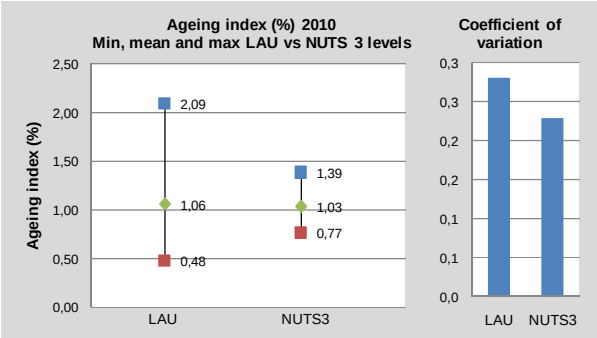
Another local situation is evident in Blekinge where all LAU areas have high ageing indexes except Karlskrona which is the region's capital city and an important regional university centre in southern Sweden. This example represents a case of high disparities within the region and between Blekinge's LAU units in relation to other LAU areas in the case study.

As expected, local areas around Copenhagen and Malmö municipalities present the lowest levels of ageing indexes due to the high presence of young population groups. The lowest local examples are located particularly in LAUs located in the vicinity of Copenhagen.

[6] The ageing index is defined as the ratio of all persons older than 64 years to all persons under 15 years. Indicator values above 1 in the map (purple colors) indicate the presence of more elderly people than children whereas values below 1 indicate a majority (green colors) indicate a majority of children compared to elderly. Regions around 1 (pink color) indicate a balance between elderly and young people.



Map 7: Ageing index in Sydsverige-Eastern Denmark, 2010

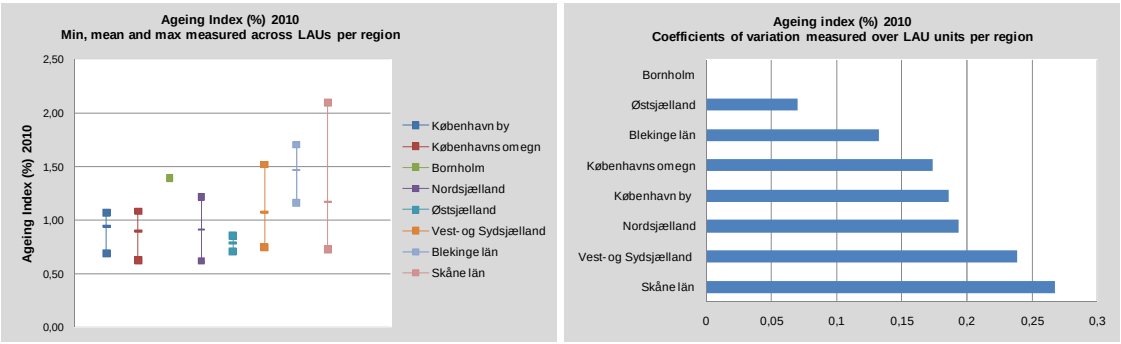


Source: National Statistical Offices of Sweden and Denmark

Figure 9: Ageing index 2010 (%): disparities within NUTS 3 and LAU levels

The statistical analysis shows a higher coefficient of variation regarding the LAU level than the one registered in the NUTS 3 level (Figure 9). The level of disparities gets broader when going down to the local level. At NUTS 3 level the highest ageing index registered is 1,39; however at local level there are a number of LAU units with indexes both higher or lower than outermost max. and min. regional figures.

As mentioned before, LAU units inside region Skåne followed by those in Vest og Sydsjaelland register some of the largest disparities in the case study in terms of ageing indexes (Figure 10). These local cases represents local examples of regional divides both within LAUs in the hinterland of major urban areas -characterised by a large proportion of young population- and both between central areas and peripheral and/or remote rural LAU units the latter characterised by a higher share of old population and out-migration patterns.



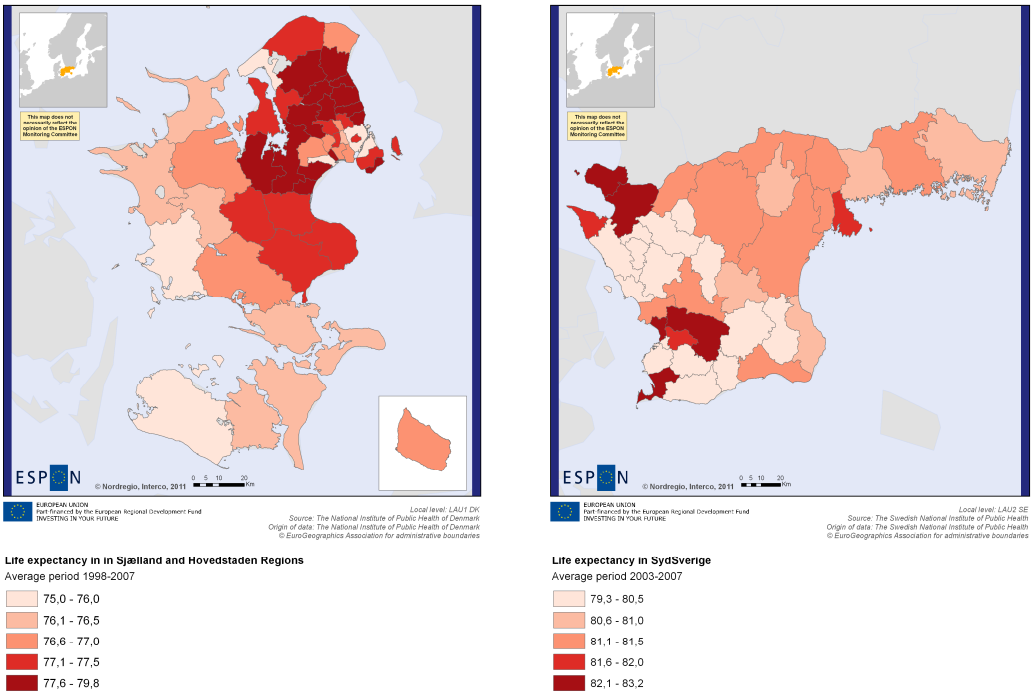
Source: National Statistical Offices of Sweden and Denmark

Figure 10: Ageing index (%) 2010 disparities measured across LAUs within the regions and coefficients of variation

3.2.3. Life expectancy

Because the case study is shared by regions in two different countries, it was not possible to find an indicator for the same period of time showing averages of life expectancy. In an effort to find the closest periods of time possible, data for Denmark 1998-2007[7] and Sweden 2003-2007[8] were founded, but the results in the maps are considered separately since the periods in question are different. The results shown in map 8 A) for the Danish side and 8 B) for the Swedish side give at least an idea of life expectancies at a local level.

Overall Nordic life-expectancy has grown steadily with few exceptions during the 20th century. Rising welfare levels and better living conditions, due to economic growth and better healthcare, have helped to reduce mortality. People's lifestyles and socioeconomic status are the two largest factors behind the change in life-expectancy.



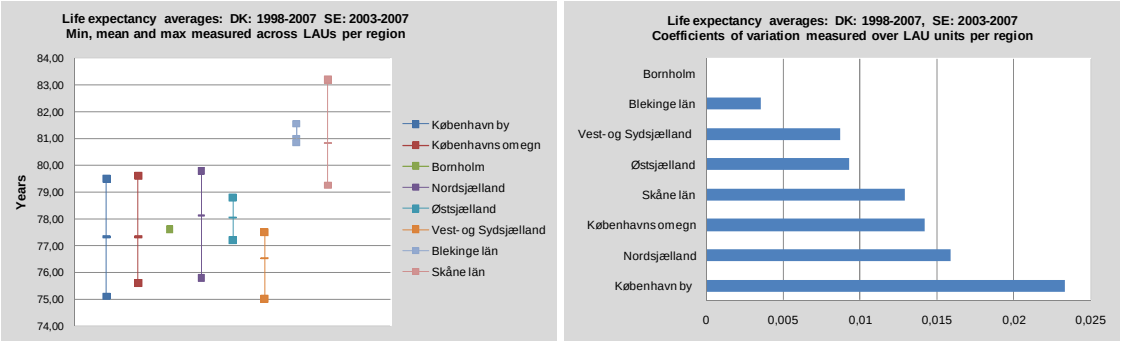
Map 8: A) Life expectancy average for 1998-2007 in LAU s of Sjælland and Hovedstaden Regions and B) Life expectancy average for 2003-2007 in LAUs in Sydsverige

The Danish life-expectancy level is still at a slightly lower level as compared to Sweden (approx. 2 years) but this might be the result of an extremely low infant mortality in Sweden. Disparities between the highest and lowest levels among Swedish LAUs is of 4 years whereas in the Danish LAUs is of 4,8 years.

[7] Averages calculated by The National Institute of Public Health of Denmark. No other periods available.
[8] Averages calculated by The Swedish National Institute of Public Health. Other periods are also available.

In general, differences between life expectancy levels in Norden can be found between urban and more rural areas where life-expectancy is higher outside the urban centres. But also differences correspond to the socioeconomic development level in local areas, closely related to lifestyles and working conditions. Socioeconomic aspects such as high levels of education and high levels of income have an influence in high life-expectancy levels which combined with other factors (such as low fertility levels or out-migration of young people) contribute also to ageing population.[9] Other factors may affect mortality and life expectancies in a local area. A healthy population with good living conditions, good health habits and good health care contribute to higher life expectancy levels. Housing conditions/prices may also affect life expectancy as it creates different moving patterns between local areas: persons with low income (and poor health) will rarely settle in municipalities with expensive housing.[10]

Based on these aspects, it is possible to find some local patterns in the case study. Figure 11 to the right shows how LAUs in regions around major urban centres such as Copenhagen (København by, Københavns omegn and Nordsjælland) are those with the highest variations, since they register both some of the highest and lowest figures. A similar situation is perceived around Malmö-Lund. This shows a correspondence with the local disparities found in this study in/or around major urban areas regarding income and tertiary education levels patterns explained in the respective sections. A number of LAUs with high income and high levels of tertiary education in the case study have also high life expectancy levels and viceversa. Other examples with high levels of life expectancies are found in northwestern Skåne (Båstad, Höganäs, Ängelhom) which happen to be high income municipalities with relatively high levels of tertiary educated population. LAUs with the shortest average life expectancies in the Danish side are concentrated on low income LAUs in Lolland-Falster and south western Zealand (Slagelse, Lolland, Guldborgsund) but also as mentioned in the hinterland of Copenhagen (Ishøj, Halsnæs and Copenhagen itself). Shortest life expectancies in the Swedish side include local examples in LAUs located in the hinterland of Malmö-Lund and Helsingborg (Burlöv, Bjuv, and Malmö itself).



Source: Public National Heath Institutes of Sweden and Denmark

Figure 11: Life expectancy disparities measured across LAUs within the regions and coefficients of variation

[9] Rauhut D. et al. (2008): The Demographic Challenge to the Nordic Countries, Nordregio Working Paper 2008:1, Stockholm, Sweden

[10] The National Institute of Public Health of Denmark (2010): Middellevetider i danske kommuner Kvinder lever længere end mænd, men der er kommunale forskelle; week 3, 2010

3.2.4. Population density

The case study are can be considered as a special example in a Nordic context with regard to population densities where significant differences are registered between highly populated areas (which include Malmö-Copenhagen the largest urban conurbation of the Nordic Countries[11]) and remote rural sparsely populated areas (in the west, south and especially east).

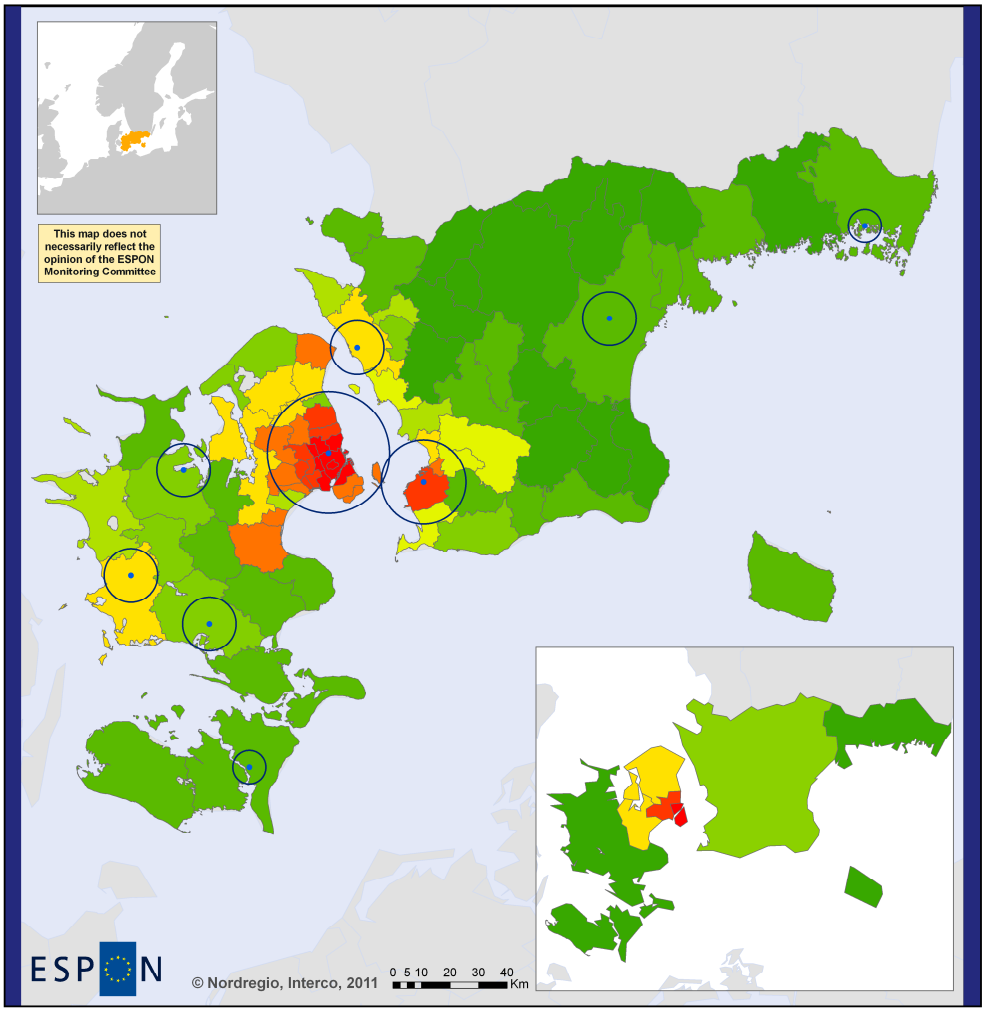
However these variations are not easily perceptible when analysing the region at the traditional NUTS 2 or NUTS 3 averages. It is only by going to the local level that large disparities pop out. Accordingly, variations between LAU units in the case study are range from 22 inhab./km² (in Osby, Skåne) up to 11,028 in Frederiksberg (Københavns by), the most densely LAU unit in the Nordic countries. This clear variation is due to the fact that the LAU level reveals a higher spatial detail in regions that at a NUTS 3 level are basically imperceptible (variations between NUTS 3 averages are also large but at a lower extent, ranging between 52 (Blekinge) and 3,769 (Københavns by) inhab./km²).

The map of population densities in the case study at a LAU level (map 9) is therefore not uniform and important regional divides between the geographical centre and peripheries of the case study become evident. Coastal areas around the Öresund strait are considerable more densely populated. Here 14 out of the top 15 most densely populated LAU units above 1,000 and up to 11,028 inhab./km² are all located in the NUTS 3 regions of Københavns by and Københavns omegn in the geographical center of the case study; the other LAU unit in this group is Malmö.

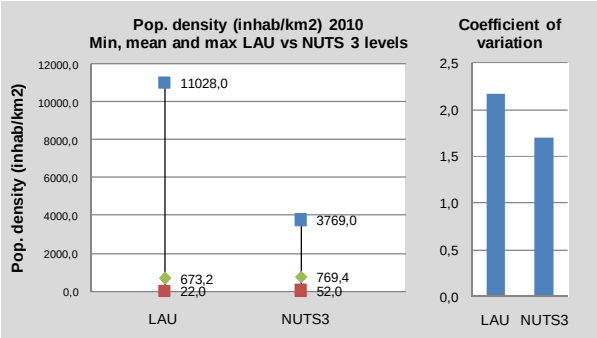
On the other hand most of the LAUs in southern and eastern peripheries register the lowest densities in the case study. In the southern periphery (corresponding to Vest- og Sydsjælland) densities range between 53 (Lolland) and 310 inhab./km² (Slagelse) while in the eastern periphery (corresponding to eastern Skåne and Blekinge) 13 LAU units register the lowest densities in the case study, all of them below 50 inhabitants per km². Moreover half of the local units in the case study (42 out of 85) register population densities below 150 inhabitants per km². This predominance of low densities among LAUs in the case study become evident in figure 12 where the majority of averages in both NUTS 3 and LAU levels are much closer to the minimum values.

There are large differences between the LAUs in terms of size in this case study. The 85 LAUs have a population span from 101 to 528 208 inhabitants and size span from 0,2 km² to 1 276 km². Size therefore is a crucial factor to consider when analysing population density in the case study. Some of the local examples registering high densities do not necessarily contain a large number of inhabitants; that is the case of Burlöv and Lomma (contiguous to Malmö) or Glostrup and Vallensbæk (around Copenhagen). In fact these 4 examples have populations below 21,000, but the fact that their areas do not exceed 55 km² and the proximity to a major urban area, place them on top of the list. On the other hand many of the LAU units registering the lowest densities also have populations below 21,000 but the larger sizes in terms of area (especially evident in Swedish municipalities) combined with longer distances from largest urban agglomerations create completely different conditions of socio-economic development.

[11] Norden (2009) available at: http://www.norden.org/en/the-nordic-region/population



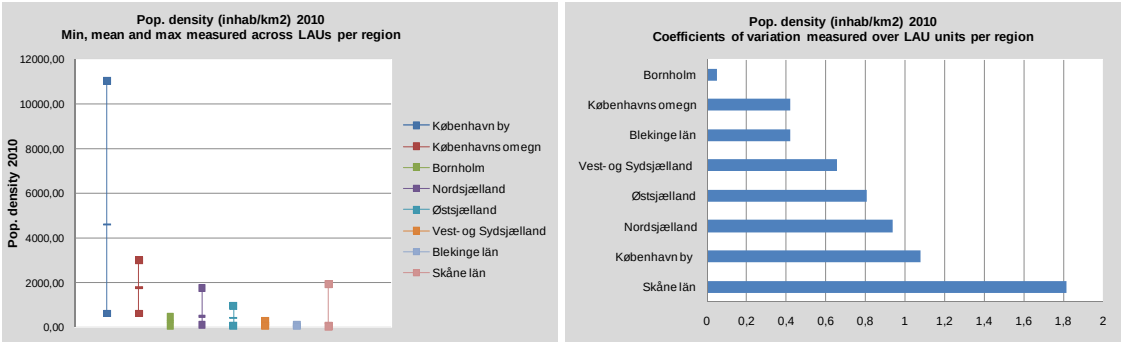
Map 9: Population density 2010 (inhab/km2) in Sydsverige-Eastern Denmark



Source: National Statistical Offices of Sweden and Denmark

Figure 12: Max, min, standard deviation and coefficient of variation of population density in 2010 between NUTS 3 and LAU level

Figure 13 shows variations in terms of density registered within NUTS 3 regions measured over LAU units. As expected, larger disparities are found between LAUs in Skåne and Københavns by, the two NUTS 3 regions containing some of the most densely populated LAUs in the case study. The contrast is more obvious in Skåne as the region is larger in terms of size and the different LAUs vary considerably in size, ranging from 19 km² (Burlöv) to 1276 km² (Hässleholm) which gives figures that also span considerably between 22 inhab/km² (Osby) and 1913 inhab/km² (Malmö). Disparities in Københavns by on the other hand are derived from the fact that the region has the local area unit with the highest density in the case study (Frederiksberg 11028 inhab/km² in an area of only 9 km²), LAUs with small sizes and much less densely populated examples such as Tårnby where densities reach 622 inhab/km². LAUs in Köbenhavns omegn and Blekinge register less disparities as all of their LAUs are of the same nature (small areas with large densities in the first one and large areas with large densities in the latter)



Source: National Statistical Offices of Sweden and Denmark

Figure 13: Population density (2010) disparities measured across LAUs within the regions and coefficients of variation

3.2.5. Population growth

The case study had a total population of 3,884,448 as of 2010 with about 2,500,835 people living in the Danish side and 1,383,653 in the Swedish side. Population in the case study is concentrated around the Öresund Strait with the majority on the Danish side. One of the main factors for population growth in the case study is migration. The general pattern indicates migration to larger cities mainly by young population moving from home to study or work. Population growth is also due to a surplus of immigrants. In total, a net of 100,000 persons have in-migrated from other countries than Denmark and Sweden, while the remaining net of 40,000 have come from both countries. Apart from migration another factor that has contributed to population growth in the case study includes a birth surplus mainly on the Danish side. Since the opening of the Öresund Bridge in 2000 and up until 2009, the population in the Öresund region has increased by about 180,000, with 90,000 people on each side. 13,000 persons have moved permanently from the Danish side to the Swedish side of Öresund. The main reasons for this are the low costs of living and especially housing in Skåne compared to Copenhagen capital area.[12]

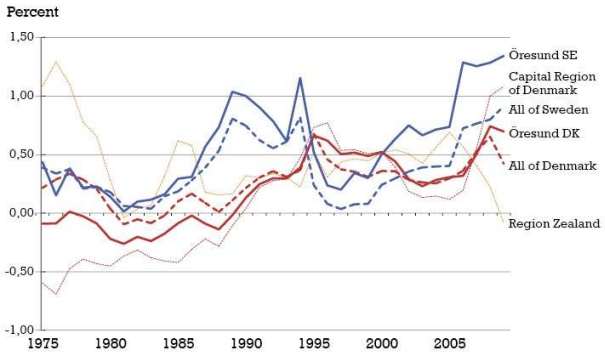


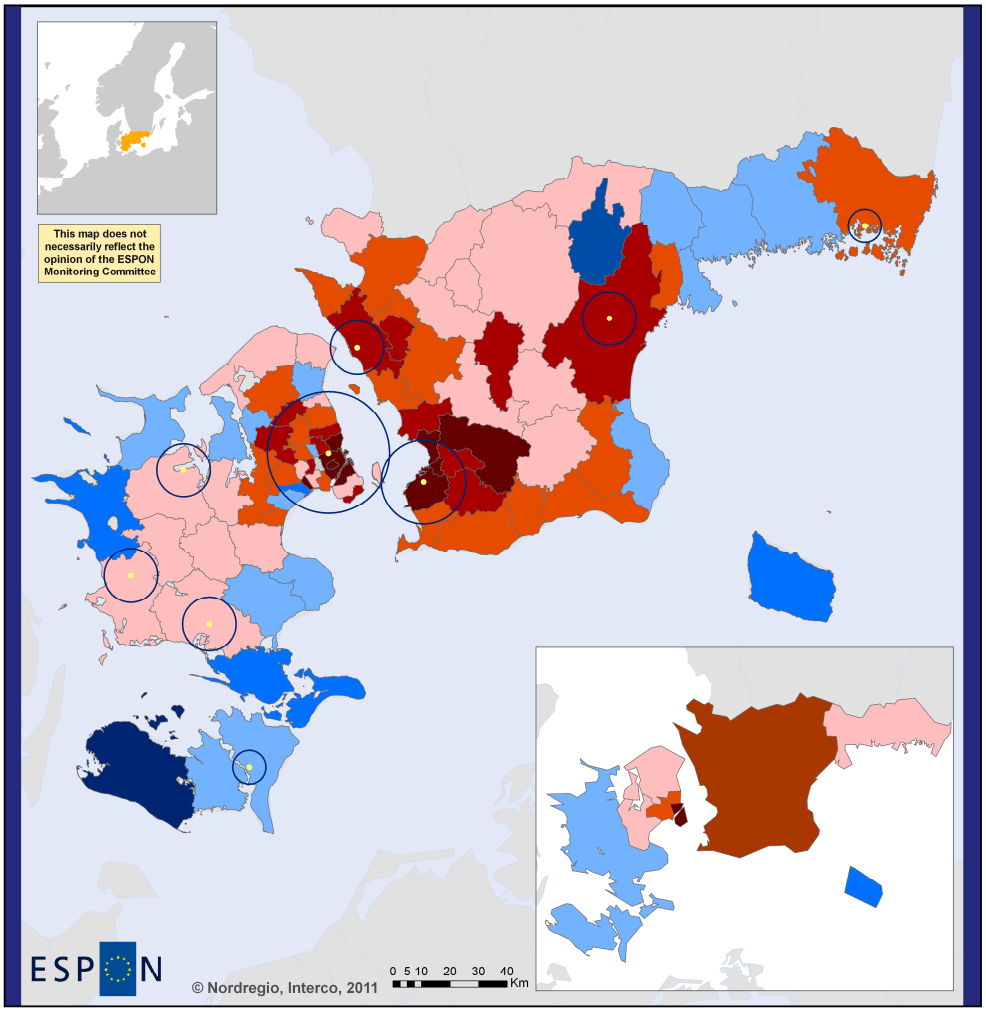
Figure 14: Population growth around the Öresund Region; source Tendens Öresund

According to forecasts developed by Tendens Öresund[13] the number of inhabitants in the Öresund region is expected to grow from 3,7 million in 2010 to 4 million in 2029, with a major concentration around Copenhagen and in the Swedish side, in contrast to Zealand where population rather will be stagnant. The population increase will be due to the increased life expectancy and, thus, it is the elderly share of the population that will increase.

In the case study, population has become increasingly concentrated to city regions and large labour markets with the option of commuting. In the Danish side over the last ten years the whole of Zealand has become part of the Copenhagen labour market, and in the Swedish side the population continues its concentration to regional centres.

[12] Region Skåne (2010): Hur har det gått I Skåne? 2010 års uppföljning av regionalt utvecklingsarbete, Region Skåne, Koncernkontoret, 2010

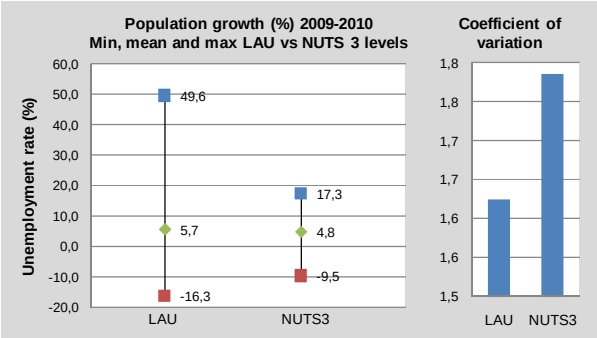
[13] Tendens Öresund is published by the Öresund Committee, and it presents facts and statistics about the Øresund Region. The Öresund Committee was established in 1993 by the local and regional authorities, together with the national authorities, as the regional policy forum for cross border cooperation.



Map 10: Population growth (%)in Sydsverige-Eastern Denmark, 2009-2010

This is especially clear in Malmö-Lund due to the existence of important commuter flows to Copenhagen as well as a result of immigration to Skåne. In contrast to this, rural and sparsely populated local areas have generally experienced population decreases. Towns and villages in the Öresund region situated at some distance from the large urban areas suffer from decreasing population and a lack of economic growth (OECD, 2003). LAUs in the islands of Falster, Lolland, Mon and Bornholm as well as LAUs in Blekinge (except Karlskrona) have seen the largest population decrease both of which had experienced significant levels of out-migration.

Important variations exist between the NUTS 3 and LAU levels when it comes to population growth. Figures at NUTS 3 levels span from -9,5 to 17,3 while LAU figures span widely from -16,3 up to 49,6.



Source: National Statistical Offices of Sweden and Denmark

Figure 15: Max, min, standard deviation and coefficient of variation of population growth in 2010 between NUTS 3 and LAU level

A concrete example of differences expressed between NUTS 3 and LAU figures is found in Blekinge. While at regional level, Blekinge has a positive population growth of 2,2%, when going deeper into the LAU level it is only the municipality of Karlskrona, capital of the region, the one with a relatively high population growth (8,5). The remaining 4 municipalities have all negative figures between -1,3 and -4,9%, Population growth in the region is driven by Karskrona the largest urban centre of the region and an important university centre in Southern Sweden. In this case it is the local level the one which is able to display these negative population patterns and disparities within LAUs in the same region.

Within regions, variations between LAUs are evident. Skåne has both the 2nd highest and lowest rates in the region. Disparities goes from -10% in Östa Goinge (a peripheral LAU) up to 29,7% in Lomma (part of Greater-Malmo urban area). This situation shows a difference between central urban and peripheral rural areas in terms of population growth. However a similar situation is evident but this time in a relatively more homogenous region such as Københavns omegn (all of it part of Greater Copenhagen). Here variations goes from -7.3% in Ishøj up to 49,6% in Vallensbæk. The analysis from the local level shows then that disparities also exist in central urban regions.

3.2.6. Income

Due to the fact that the Sydsverige-Eastern Denmark is located in two different countries there were difficulties to find a single indicator of disposable household income for the whole case study area at the local level. It was possible to find an indicator calculated by Ørestat (the official local statistical institution of the Öresund Region supported by Statistics Sweden and Denmark) that measures average family income[14] after taxes, harmonised at Swedish kronors[15] at LAU level for the case study except Blekinge. Both the Swedish and Danish income statistics are based on information collected from the central tax authorities by Ørestat[16].

Even though the tax systems of Sweden and Denmark are very similar, payments to the social insurance systems differ considerably. As a result, salaries (and in turn income) in Sweden are lower than in Denmark (Maps 11A, 11B). In Sweden, it is the responsibility of the employer to pay a fee of 32.82 % of earnings. In addition to these employers' fees, employees also pay 7% of their income in general pension fees. In Denmark, employers only pay a small sum in fees for pensions and occupational accident insurance, and employees pay 8% to a labour market contribution fund. From 2003 onwards, employees also contribute another 1% to pensions. (Ørestat, 2005)

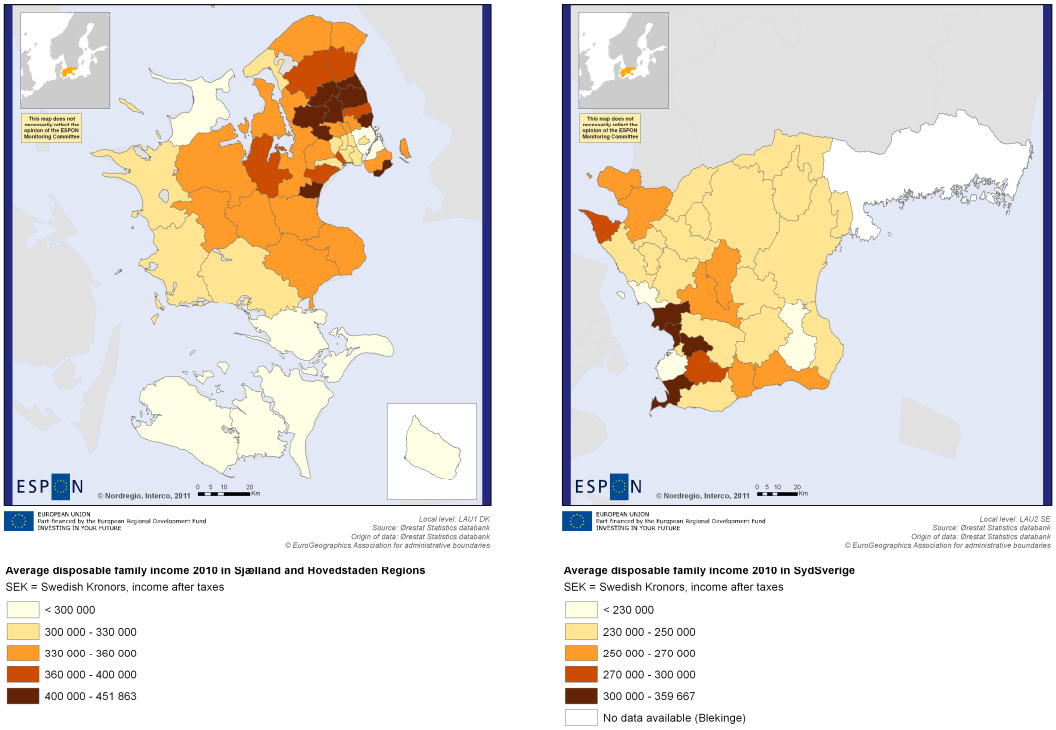
Therefore, Ørestat is keen to express that these differences indicate that it is not possible to directly compare income from salaries in Denmark and Sweden. As they say, differences between the two countries are less when comparing income after taxes, but in any case the income statistics calculated by Ørestat may be used within the limits of reason to follow development of disposable income as an indicator for income development in the various parts of the region.[17] Maps in this section are therefore presented individually for each country following Ørestats' recommendations.

From map 11A it can be seen that local examples with high average income per family in the Danish side are found in a number of LAUs around Copenhagen while the lowest figures are found in the southern periphery of Zealand, Bornholm and the single LAU unit of Copenhagen. In the Swedish side -map 11B- the pattern is similar and highest figures are found in LAUs around Malmö, while the lowest figures are found in peripheral eastern and northern LAUs as well as in the single LAU unit of Malmö.

The analysis at the local level allows us to identify some local patterns. Low figures are not exclusively associated to LAUs in remote or peripheral regions in this case study; LAU areas in or around major urban areas also register both some of the lowest but also the highest levels in the case study which leads to high local disparities between LAUs in

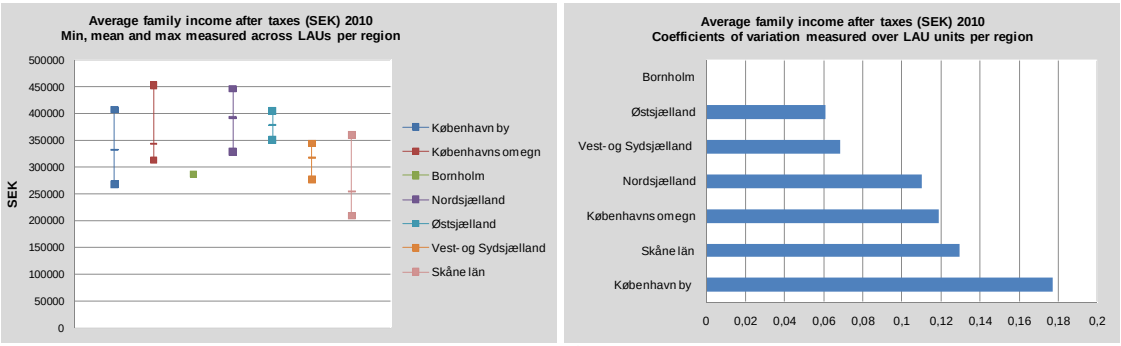
[14] The indicator is available at the Ørestat databank, The indicator in question considers as total income the following categories: wages and salaries, income from self-employment, capital income, taxable pensions and other family transfers. Statistics are available at: http://www.dst.dk/extranet/oresund1/ Eurostat purchase power parities have been used to convert DKK to SEK and vice versa (see ESA95 aggregates 97-.
[15] Figures are also available in Danish kronors but to make the results somehow comparable it was decided to use a single currency, Swedish kronors.
[16] Complete methodology about Örestat's calculation of this indicator is available at: http://91.208.143.50/pxweb/Database/oresund/Income%20in%20%D8resund/Indkomster_UK.pdf
[17] Idem.

the hinterland of a major urban centre like Copenhagen. A couple of examples are also found around Malmö-Lund.



Map 11: A) Average family income after taxes 2010 (SEK) in LAUs in Sjælland and Hovedstaden Regions, and B) Average family income after taxes 2010 (SEK) in LAUs in Sydsverige

Figure 16 shows that disparities are therefore higher in LAUs located in regions around Copenhagen (København by and København omegn) same as Skåne. In the Swedish side high figures include Vellinge, Lomma, Kavlinge and Staffanstorp, all of them in the vicinity of Malmö-Lund. In the Danish side highest figures include LAUs contiguous to Copenhagen especially in Nordsjælland and lowest figures apart from Copenhagen itself are found in LAUs in Lolland-Falster, Bornholm and north and south Zealland (Slagelse and Odsherred followed by Næstved and Kalundsborg).



Source: Ørestat

Figure 16: Average family income after taxes disparities measured across LAUs within the regions and coefficients of variation

4. Geographical specific/ indicators in the case study: searching for 'native' indicators

It is also of interest in this level to identify indicators available at the local level that do not exist at the EU regional level but that might be of interest for the other levels in the framework of Territorial Cohesion; that is geographically specific local indicators as examples to show efforts to measure relevant EU and national concepts at a local level.

Business Environment

Particularly in Sweden, there have been a number of efforts from different organisations to develop indexes able to measure business environments at a local level.

Under the approach of Europe 2020, business environment is pointed out as a crucial component of one of the 7 flagships initiatives to catalyse progress under the priority themes (smart, sustainable and inclusive growth): Europe 2020 promotes "*An industrial policy for the globalisation era" to improve the* ***business environment****, notably for SMEs, and to support the development of a strong and sustainable industrial base able to compete globally*". According to EC's "Summaries of EU legislation"[18] a favourable business environment is pointed out as essential to help entrepreneurs developing a business as well as it contributes to develop an entrepreneurial culture and making business in Europe more attractive. In Sweden and Denmark, entrepreneurship is part of the national strategic objectives of Cohesion Policy 2007-2013[19] and in particular the concept has a local importance for the case study as it is included In the Operational Programme for Sydsverige (Blekinge-Skåne) as a main component in one of the three main areas of intervention.[20]

Results from the indexes vary from each other depending on the methods and indicators measured. Aware of this, Region Skåne, in association with the Swedish Agency for Economic and Regional Growth (Tillväxtverket), developed an evaluation[21] of the different indexes existent. The aim of the study was to clarify how municipalities in Skåne can use the indexes for their own benefit as well as it constitute an attempt to locally compare indicators on business environment on the basis that companies, entrepreneurs and citizens have also the need to know how the municipality is performing. Even though the study concluded that the concept of business environment as such does not have a universal definition (and therefore the different indexes analysed are built on different sets of indicators and methods), the development of these type of indexes constitute an important effort to measure an important National and EU concept at a local level. One of the indexes analysed at a broader scale in the study (*Företagsklimat)* is randomly selected now with the intention to show an example of these efforts.

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[18] Available at: http://europa.eu/legislation_summaries/enterprise/business_environment/index_en.htm
[19] Sweden: http://ec.europa.eu/regional_policy/atlas2007/fiche/se_en.pdf ; Denmark: http://ec.europa.eu/regional_policy/atlas2007/fiche/dk_en.pdf
[20] Page 5, Regionalt strukturfondsprogram för regional konkurrenskraft och sysselsättning I Skåne-Blekinge 2007–2013
[21] Study available at: http://www.skane.se/upload/Webbplatser/Naringsliv/Dokument/DetLokalaKlimatet.pdf

Företagsklimat index: an effort to create a local index on business environment

The *Företagsklimat* index is published every year by the Confederation of Swedish Enterprise (Svenskt Näringsliv) based on structural indicators and surveys. Statistics are constructed in close cooperation with SCB, the Swedish National Statistics Institution, and surveys are conducted among entrepreneurs in all municipalities*. For the 2010 index, a total of 66,134 surveys were send to entrepreneurs having a response of over 55%. Entrepreneurs are selected as target group for the surveys as they are seen as those who have a better knowledge of the situation locally in each municipality in terms of current status, challenges and potentials to be considered. Every two years surveys are also send to local politicians (13,046 surveys sent with a response of 68%) even though their answers are not included in the final ranking; instead they are used as a tool to locally develop the different business environments in the municipalities.

Entrepreneurs get to rate how they perceive the business situation from a series of questions on different aspects and the ranking consider six structural business indicators managed by SCB. These aspects and indicators (and their respective weighting is presented in table below. The results are published on-line showing both the general index at a local level and the individual rankings for each of the aspects considered plus a number of additional business statistics all at a local level. **

Business environment Index – Indicators considered and weighting

STATISTICS (1/3)	SURVEY ANSWERS (1/3)	SURVEY ANSWERS (1/3)
Earned household income (from private sector)	Attitudes towards companies and entrepreneurs	The comprehensive review of the business environment in the municipality
Local municipal tax rates	Public local services	
Share of total municipal budgeted activities that are outsourced to private operations	Appropriate application of municipal laws and regulations	
Employment rate	Competition in the private sector	
Share of private sector employers per 1000 inhab. (in companies with at least 1 employee)	Infrastructure	
Share of new business starters per 1000 inhab. that became enterpreneurs* in the last year	Acess to qualified human resources	

**Entrepeneur is considered as a person responsible for the development of the company, declaring taxes, is partner in an active partnership, is manager, president or ordinary board member of an active company*

Source: Svenskt Näringsliv. Adapted by Nordregio. For further details refer to Svenskt Näringsliv

*The survey was sent to 200 entrepreneurs in municipalities with less than 1,200 workplaces and less than 50,000 inhabitants, to 400 entrepreneurs in municipalities with more than 1,200 workplaces or 50,000 inhabitants, to 600 entrepreneurs in Malmö and Gothenburg and to 1,200 entrepreneurs in Stockholm

** Results at a local level are available online at: http://foretagsklimat.svensktnaringsliv.se/start.do

Regional Accessibility Atlas in Skåne

As mentioned in the introduction section, the case study as a whole register favourable accessibility conditions when it comes to infrastructure and connectivity due to the existence of major European air and harbour hubs both for passengers and cargo supported by an active network of airports, ports, railways and motorways that serve as a gateway to the Nordic countries. However this picture when viewed from a local perspective lifts up geographical disparities among different local areas, otherwise imperceptible at regional level:

Tillgänglighetsatlas: Geografisk tillgänglighet för Skåne or
Accessibility Atlas: Geographical accessibility in Skåne *

Region Skåne, aware of the geographical disparities in terms of size between the different administrative divisions traditionally used to presents results, developed an Atlas on accessibility calculated independent from administrative divisions (i.e. LAU, municipalities and local labour markets). What makes interesting the Atlas is not only the method used to generate the results but also that it allows the illustration of local situations with a higher geographical detail which facilitate the observation of disparities.

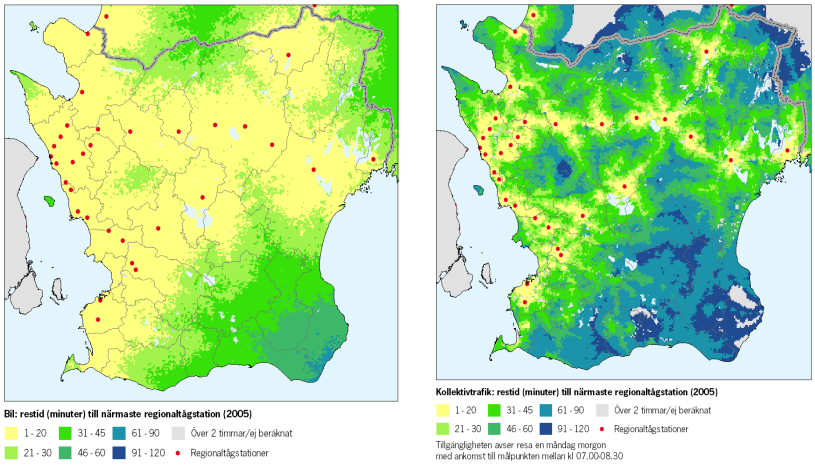
The method calculates accessibility including a system of cells (500x500 meter) and in cooperation with Statistics Sweden, Region Skåne developed a database that contains ground statistics for the cells.

Region Skåne's Atlas on accessibility conditions includes a wide set of indicators measuring accessibility (in time) by car and public transport to different physical and/or infrastructural elements such municipal cores, urban areas, hospitals, airports, national and regional train stations, regional bus stops, universities, schools, working places (i.e. reached before 30, 45 or 60 min.) among others. A sample of some of the maps produced by Region Skåne for this Atlas is shown in maps 12, 13 and 14, including accessibility by car to the left and by public transportation to the right to regional train stations, universities and hospitals respectively.

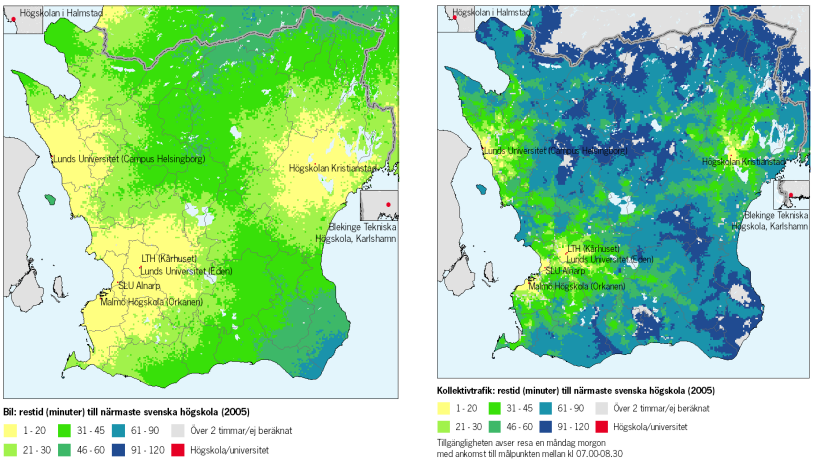
Results are different depending of the element in question and disparities goes beyond traditional LAU borders giving a more clear picture of areas with weaknesses.

Accessibility is a top priority in the Swedish NSRF 2007-2013** and this example reveals the intention of exploring a crucial theme for Territorial Cohesion at a regional-to-local level by own initiative in this case by Region Skåne. Equivalent studies in other regions in the case study area were not found.

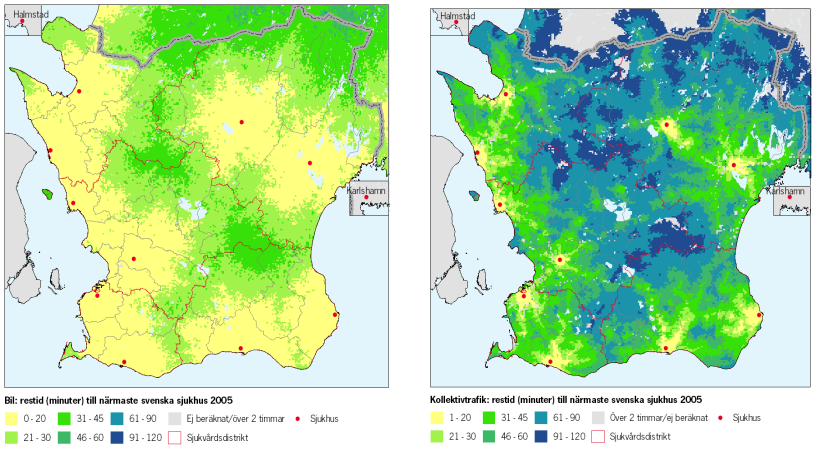
Region Skåne's study is called (in Swedish) "Tillgänglighetsatlas: Geografisk tillgänglighet för Skåne". The report is developed by Oscar Monell, Per Arvidsson and Åke Boalt. Available in Region Skåne's website at:
http://www.skane.se/sv/Skanes-utveckling/Samhallsanalys/Tillganglighetsatlasen/
** http://ec.europa.eu/regional_policy/atlas2007/fiche/se_en.pdf



Map 12: Accessibility to regional train stations in Skåne. Source: Region Skåne



Map 13: Accessibility to high education institutions in Skåne. Source: Region Skåne



Map 14: Accessibility to hospitals in Skåne. Source: Region Skåne

5. Key findings and conclusions

The analysis of the case study area at LAU level displays important local disparities among the different parts of the region distinguishing local areas around urban centres with well-structured knowledge economies in contrast with local areas in need of economic restructuring and regeneration, and some sparsely populated rural local areas located at a relative distance from main urban centres.

The analysis at a local level was also able to visualise larger gaps between LAU units than NUTS regions as all the ranges of results at LAU level in all of the indicators selected were larger than the ones registered by NUTS 2 or 3 figures. Consequently figures at a local level show larger coefficients of variation implying therefore a broader level of complexity of the indicator at a local level.

Figures at local level were also able to illustrate strong disparities in a single NUTS 3 region depending on the settlement structure of its units. A clear example here is Skåne, where high local disparities were identified in terms of ageing indexes, distribution of population, education levels, unemployment patterns, among others, due to the diverse structure of the region where the majority of population and urban areas are located in the west (along the coastline) in contrast to the majority of rural and sparsely populated areas located inland in the north or east. Such complexity and diversity was better illustrated by conducting this analysis at local level.

But the analysis at a local level also enabled us to identify that weak performing local areas are not exclusively restricted to peripheral or rural sparsely populated areas but on the contrary low performing local examples are also found in central regions around major urban centres along the Öresund Strait in the hinterlands of Copenhagen, Malmö-Lund or Helsingborg. However the difficulties founded when trying to get available data at these LAU levels constitute a major constraint. Average regional figures are unable to show exceptional local situations for example remarkable LAUs with some of the highest shares of tertiary level educated population or critical LAU examples with some of the highest unemployment rates or ageing indexes.

The analysis of the feasible indicators has shown that by going beyond the traditional regional levels, a higher spatial detail is revealed, even in countries where disparities at national levels are low.

Efforts developing indicators to measure crucial National and EU concepts at a local level (such as accessibility) were found in Skåne thanks to the Atlas on local accessibility developed by Region Skåne. Also in Skåne and Blekinge an effort to measure business climate and entrepreneurship is found thanks to i.e. the Swedish *Kommunranking* which develops an index based on structural indicators related to business and entrepreneurship as well as surveys to local entrepreneurs in every single municipality/LAU.

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The ESPON 2013 Programme

INTERCO

Indicators of Territorial Cohesion

Scientific Platform and Tools Project 2013/3/2

Annex 6

Piedmont

(Italy)

Prepared by Minas Angelidis,
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Figures, Maps and Tables

Abbreviations

EU-27: 27 Member States of the European Union
GDP: Gross Domestic Product
GDP PPS: GDP in Purchasing Power Parities
NUTS Nomenclature of Territorial Units for Statistics
TC: Territorial Cohesion
ISTAT Istituto nazionale di statistica (National Institute for Statistics of Italy)

Objectives

The objective of the case studies is to locally explore the Headline indicators defined in the framework of the Interco Project as a way to characterize local situations.

The analysis of the feasible indicators is intended to show that higher spatial inequalities are revealed when going beyond the traditional NUTS 3 level of study. Territories which seem to have certain level of spatial disparities in the traditional NUTS-3 level of analysis might register other degrees of disparities/inequalities at a local level. The idea is to observe if the analyses at LAU level bring important new insights regarding TC patterns at NUTS 3 level as well as differences between them.

Additionally to this it is of interest to identify indicators available in the local case-studies that do not exist at the EU regional level but that might be of interest for the other levels in the framework of Territorial Cohesion.

Summarising, the main objective is to create awareness of the existence of another spatial layer/level of study additional (and complementary) to the traditional NUTS 2-3 scales, where more complex spatial patterns exist but seem to be imperceptible in the traditional way of displaying indicators on the basis of these regional scales.

The local level is not intended to substitute or compete with other scales of analysis, but rather is intended to open a dialogue between different scales that increasingly overlap temporally and spatially. It is intended to serve as a complement to other scales, as a contributor to decipher the complexity of territorial cohesion.

1. Case study introduction

1.1. General features

The **region of Piedmont** (ITC1 – NUTS2 level) is situated in the north-western part of Italy *-see in the Map 1.1.1-;* it has an **area** of 25,402 km² and a **population** of about 4.4 million.

Map 1.1.1: Situation of Piedmont in Italy

Physical-geographical morphology
The half (43%) of the territory of Piedmont is mountainous, with the Alps forming a belt from north-north-east to south-west and dividing Piedmont from the Swiss regions of Valais and Ticino and from the French regions Rhône-Alpes and Provence-Alpes-Côte d'Azur.

Spatial economic structure
Piedmont can be hardly defined as a 'monocentric' region. Many of its eight provincial capital cities, as well as some other towns, maintain their socio-economic importance that is often based on specific industrial activities or agricultural production.

"The territory of the Piedmont region can be represented as constituted by different "quadrants", which barely are the results of an aggregation of Piedmont provinces (supra-municipal local authorities, with elected governments).
This aggregation is due to the need to overcome the lack of size concerning the capability to promote autonomous and effective strategic actions.

In this way, "four Piedmonts" are indentified as follows (Buran, 2010):
- North-West: constituted by the **Province of Torino**, and characterised by a **strong neo-industrial identity**, based on former Fordist organisation. It plays the role of international gateway for the region, thanks to the privileged links developed with other Italian and European cities and regions, in particular with Milan and Lion.
- **North-East -not included in the case study area-:** constituted by the Provinces of Biella, Novara, Verbania and Vercelli, this area hosts a high number of the industrial districts forming the so-called made-in-Italy (clothes, furniture, and machinery).
- South-East: it coincides with the **Province of Alessandria**; the location on the borders with the Genoa area and its harbour makes it particularly adapt to host logistic platforms

- South-West: the **Provinces of Asti and Cuneo**; this area is dominated by the **agro-industrial industry** and has shown a recent and performing industrialisation, based on small firms; it also developed a set of interesting links and relations with the Western Riviera of the Liguria region as well as with the French region of Provence-Côte-d'Azur. Its spatial organisation is based on a highly cohesive network of medium-sized cities".
(DEMIFER 2010)

1.2. NUTS / LAU level classification

According to the Eurostat NUTS / LAU classification (see in EU RAMON NUTS) Italy is divided into 21 NUTS-2 units corresponding to Regions (Regioni), 107 NUTS-3 units corresponding to Provinces (Province) and 8,100 municipalities (comuni).

The Piedmont region includes the provinces -**NUTS3 level**- of Torino, Vercelli, Biella, Verbano-Cusio-Ossola, Novara, Cuneo, Asti and Alessandria. They are divided in 1,206 municipalities which correspond to **LAU2 units.** We note that there are not in Italy LAU-1 units.

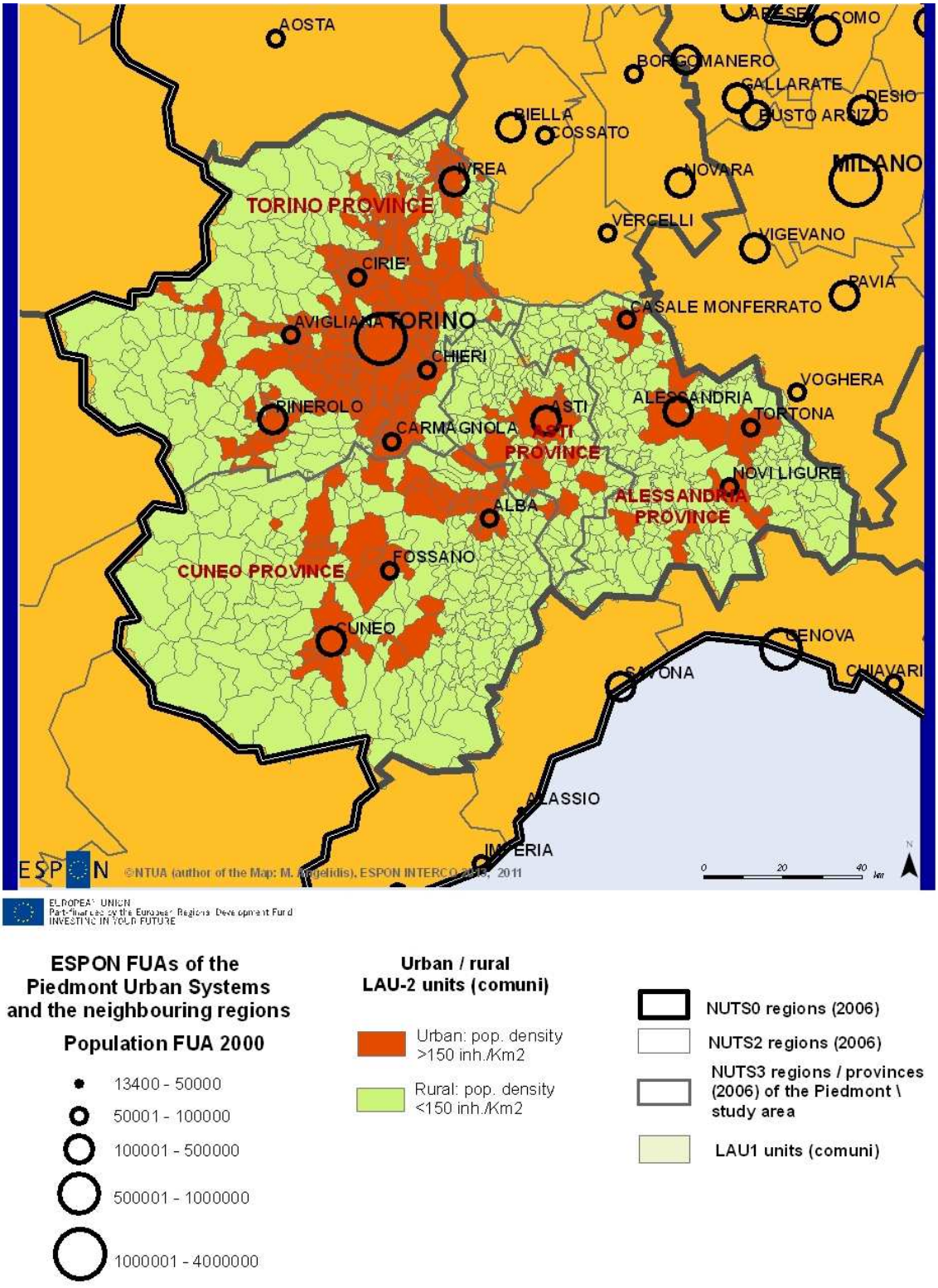
We have decided to include in our study only the Piedmont's provinces of Torino, Cuneo, Asti and Alessandria (ITC11, ITC16, ITC17 and ITC18) because this sub-area of Piedmont enables us to analyse the inequalities among a metropolitan region and its periphery as well as those among urban and rural regions and among mountainous and lowland regions. So, in next where we mention the Piedmont region we refer to this specific four provinces – see in Map 1.2.1.

The Province of Torino (capital: Torino) has an area of 6,830 km², and a total population of 2,277,686 (31.12.2007). It includes 315 municipalities (comuni) (source of the data: ISTAT)

The Province of Cuneo (capital: Cuneo) has an area of 6,903 km², and a total population of 556,359 (2001). It includes 250 municipalities.

The Province of Asti (capital: Asti) has an area of 1.504,5 km², and a total population of 206,265 (2004). It includes 118 municipalities.

The Province of Alessandria (capital: Alessandria) has an area of 3,560 km² and a total population of 429,080 (2005). It includes 190 municipalities (comuni).



Map 1.2.1: Piedmont study area: NUTS3 units (provinces), LAU2 units (comuni) and FUA, urban and rural LAU-2 units (comuni)

Source of data: Eurostat and NSO of Italy, author of the Map: M. Angelidis

1.3. Territorial typologies

In order the following case study analysis be representative at European level as much as possible, it is worthwhile to refer to a “mega-region” typology for the EU level as well as to territorial typologies at NUTS-3 and LAU level.

As for the “mega-region” typology for the EU level, we could point out, in general terms, hat the study area of Piedmont belongs to the type of European North territories.

Regarding the **NUTS-3 level**, we could refer to the ESPON territorial typologies (see in next). We should note that these typologies regard only the NUTS-3 level –not the NUTS-2 level.

As for the **urban-rural typology**, Piedmont includes one predominately urban NUTS-3 region which is also characterized as a big metropolitan region (Torino) and three predominately rural NUTS-3 regions - close to a city (Cuneo, Asti and Alessandria).

Piedmont also includes one moderately **mountainous** region under urban influence (Cuneo).

It also includes one NUTS-3 region which is characterized as a **coastal** region with a low share of coastal population (Alessandria)

Finally, Piedmont’s regions (Torino, Cuneo, Asti, and Alessandria) are characterized as **industrial regions in transition** and more specifically as regions with industrial branches losing importance.

Regarding the **LAU level:**

As for the **settlements’ network,** Piedmont has four important cities and a wide number of urban municipalities –defined here on the basis of the population density in 2001: > 150 inh. / Km2 – *see in Map 1.2.1.*

Piedmont’s population is widely dispersed across the region. At the 2001 Population Census, just fewer than 7% of the population lived in isolated dwellings (but this proportion was more than 18% lived in the agricultural province of Asti and 16% in the mountainous province of Cuneo). The rest of population lived in a good 7,654 localities, collected into 1,206 municipalities that ranged from 46 to 865,263 inhabitants. Only 53 localities numbered more than 10,000 residents; only the city of Torino had more than 100,000 inhabitants (863,669);

1/6 of the population resided in communities of less than 1,000 inhabitants. 2/5 of the population lived at an altitude of between 250 and 600 metres and 55% lived below 250 metres above the sea level.

Finally, there are 15 ESPON **Functional Urban Areas** (FUAs) located in the Piedmont Region study area: Torino, Carmagnola, Pinerolo, Chieri, Avigliana, Cirie, Ivrea, Cuneo, Fossano, Asti, Casale Monferato, Alessandria, Tortona, Novi Ligure and Alba. *See in Map 1.2.1.*

2. Data availability in the case study

We examined the **feasibility of the INTERCO headline indicators as for the data availability at LAU-2 level in the case of Piedmont region**. As it is presented in the Table 2.1 there are available data at LAU-2 level for Piedmont region for the following indicators:

(1) Population, unemployment, level of education

- Ageing index, dependency rate, population average annual growth

- Share of tertiary educated people in %

- Unemployment rate, difference between female and male employment rates 20–64, employment rate, and population density.

There are data from the censuses of 1991 and 2001. In 2011 there will be data from the population census of 2011. This remark refers to all EU-27 countries because almost all are implementing a population census in 2011. Therefore one will be able to calculate the interval values for 1991 to 2011.

(2) GDP, income.

In **Italy** there are data for GDP at NUTS-3 level.

It is difficult to find enough reliable data on households' income at LAU level. See in more detail in the EU – SILC survey for Italy.

For all other INTERCO headline indicators there are not directly available data at LAU-2 level for the Piedmont study area.

Table 2.1: The list of the INTERCO headline indicators, availability of data for these indicators at LAU-2 level for Piedmont region

Thematic sub-category name	Indicator name	Data availability
		Piedmont at LAU-2 level
Population Structure*	Ageing index (persons 65+ / persons 0-14)	+
Population Structure*	Dependency rate	+
Population Structure*	Life expectancy at birth	
Total population	Population potential within 5 km	
Total population	Population average annual growth	+
Energy	Share of renewable energy in final energy consumption and increase needed to meet the 20% target	
Education	Population aged 30–34 with a tertiary education in 2008 and distance to Europe 2020 target	
Education	Share of tertiary educated people in %	+
Health	Healthy life expectancy (ESPON 3.2)	
Health	Self-perceived personal state of health in EU Member States (5th CR)	
Poverty	At persistent risk of poverty rate (Population share with 60 % of the national equivalent median income)	
Poverty	Share of population living in workless or low work intensity households (5th CR)	
Other social	Work-life balance in EU Member States (5th CR)	
Quality of life	Happiness Index	
Quality of life	Share of population reporting crime, violence or vandalism by degree of urbanisation (5th CR) -	
Employment, Unemployment	Difference between female and male employment rates, 20–64	+
Employment, Unemployment	Employment rate change (growth)	+*
Employment, Unemployment	Unemployment rate per age: classes of 5 years	+*
Employment, Unemployment	Development of unemployment rate (male, female, young, total, 99-04)	+*
Income and Consumption	GDP per inhabitant (capita) in PPS or Euros, per year	
Income and Consumption	GDP change per inhabitant (capita) in PPS or Euros	
Income and Consumption	Median disposable annual household income	
Investments, Finances and Expenditures	Public sector debt relative to GDP	
Environment quality	NATURA 2000 area (Share of Natura 2000 area in %)	
Natural assets	Consumption of water per capita	
Governance	Electoral participation	
Governance	Voice and accountability	

* Years of censuses

3. Analysis of TC on the basis of feasible headline indicators

In this section we will analyse TC in the “local scale” case of Piedmont on the basis of both NUTS-3 and LAU-2 data as a major objective of our research is exactly to see at **which extent the TC pattern of Piedmont at the (local) LAU-2 level differs from the respective pattern at (regional) NUTS-3 level.**

As we have mentioned previously, we can’t examine a great number of TC indicators at local level because the respective data are scarce. We will examine only five indicators:

- One indicator of “competitiveness”: unemployment rate. In addition, we will comment the GDP at NUTS-3 level.

- Four indicators of “inclusion”: ageing index (people aged 65+ / total population), population density, population growth and share of tertiary educated people. In addition, we will comment the Life expectancy at NUTS-3 level.

Therefore, we will not give a complete analysis of TC at local level in Piedmont. We will only try **to see if the analyses at LAU-2 level bring important new insights regarding the TC patterns at NUTS-3 level as well as on the differences between these two last.**

In more detail, we will examine several types of statistics of variation at NUTS-3 and LAU-2 level: min / max, mean (average), standard deviation and coefficient of variation and we will evaluate at which extent these statistics reflect the inequalities regarding TC.

The analysis of the feasible indicators is oriented to study TC inequalities regarding some of the more important ESPON **territorial typologies** at NUTS-3 level (between urban and rural areas, mountainous and lowland areas, coastal areas, islands, industrial decline areas) in the case of Piedmont. We will also try to study TC inequalities at LAU level according analogue typologies for this level – see in the section 1.3. Finally, we will try to assess TC inequalities among other territorial types as for instance among “peripheral” and central areas.

3.1. Competitiveness

The Piedmont region's economy was based until the '70s on industry including primarily a highly developed automotive sector but also an important textile sector, which both continue to represent the cornerstones of the regional economy. However, during the last decades both sectors showed a considerable reduction in wealth production, productivity and value added linked with the crisis of automotive and textile industry, Therefore, Piedmont is undoubtedly a region in "industrial transition".

> As it was pointed out in the ESPON FOCI case study for Piedmont (which focused on the urban system of the region –on the basis of NUTS3 data) (2010):
> "Within the condition of general economic recession that characterises the national scale [Italy], the north-western Italian regions have recently shown a slowdown which appears stronger, in comparison with the dynamism of the last twenty years. In this concern, the performance of Piedmont region appears to be even more negative".

Piedmont has actually some indisputable points of excellence in the different sectors (e.g., rice-growing in the province of Vercelli, fruit plants in the province of Cuneo, wine-growing and vegetable growing in various hill and plain areas; fine and automatic mechanics in the Torino, Biella and Novara areas; winter tourism in some famous mountain resorts; and the Torino Politecnico) (DEMIFER 2010) but despite the exploitation of these advantages the region has not overcome enough the industrial crisis.

The **GDP rate** of Piedmont Region for 2009 has been -5%, a huge fall down mostly provoked by the decrease of the internal demand, due to a reduction of investments and households consumption, as well as to the negative dynamics of the external demand (-20% of export) (ESPON FOCI 2010 referred to: IRES, 2008). During the last years, Piedmont's per capita GDP falls between the average figure for Italy as a whole and that for the regions in the North-West, and the same is true for productivity per labour unit (ESPON DEMIFER 2010 – see for more details in the two above mentioned documents)

The recession in industry has been accompanied by shrinkage in industrial **employment**, especially in the automotive and textile sectors. "This reduction has been compensated by a rise in services employment, particularly in services for business; however, this positive dynamics didn't manage to balance the whole increase of unemployment (+1,3% in 2009), which reached the rate of 6,8% in 2009 (in comparison to the 5,3% of Northern Italy and the 7,8% of the whole country)" (ESPON FOCI 2010).

> ESPON DEMIFER 2010 summarises the employment changes in Piedmont as follows: (i) Sharp reduction in younger workers (–99,000 overall, aged 15-34 years), mainly due to insufficient cohort turnover (–159,000), which has not been offset by net migration (+70,000), but was aggravated by a decrease in the employment rates (–10,000); (ii) Increase in older workers (+198,000 overall, aged 35 years and over), caused by the cohort turnover (+40,000), positive net migration (+40,000) and, especially, by an increase in the employment rates (+113,000), particularly for women (+84,000).

According to ESPON FOCI 2010: "The relatively high drawbacks of the described situation in terms of productivity and occupation and the associated reduction of the competitive advantage of the regional economy within the overall national scenario represent therefore **the main challenges that the region is currently trying to tackle**".

3.1.1. GDP

As we have already mentioned, in Italy there are GDP data at NUTS-3 level (provinces) and above.

The province (NUTS-3) of Torino possesses GDP / inhabitant slightly higher than the national average (28.500 against 25.800) – *see in the Table 3.1.1.* The rest NUTS-3 units (provinces) of the Piedmont study area have GDP / inhabitant that are similar to the one of Torino.
During the period 2001-2007, the province of Torino presents a very low increase rate in GDP / inh: 6,3% which is much lower than both the EU27 (26%) and the national average (11%).
The predominantly rural NUTS3 units of Cuneo, Asti and Alessandria have higher rates than the predominantly urban[1] province of Torino (18,2%, 14,0% and 14,5% respectively, Torino: 7,5%) (Source of the data: Eurostat). We note that the GDP rate change is higher in the province of Cuneo which is "more mountainous" comparatively to the other provinces[2].

Table 3.1.1: GDP PPS per capita 2001-2007 in EU-27, Italy, Piedmont region (ITC1) and provinces (NUTS3) of the Piedmont study area

	GDP Purchasing Power Standard (PPS) per inhabitant			GDP Purchasing Power Standard per inhabitant in percentage of the EU average			GDP growth
	1997	**2001**	**2007**	**1997**	**2001**	**2007**	**2001-2007**
EU27	16200	19800	24900	100	100	100	26,3
IT - Italy	19300	23300	25800	119	118	104	11,2
ITC1 -Piemonte	21700	25800	28300	134	130	114	10,1
ITC11 - Torino	22900	26800	28500	141	135	115	7,5
ITC16 - Cuneo	21700	25800	30300	134	130	122	18,2
ITC17 - Asti	17800	22100	25200	110	112	101	14,0
ITC18 - Alessandria	18800	24100	27400	115	122	110	14,5

Source of the Table: DEMIFER 2010

[1] According to the ESPON territorial typology of urban and rural regions at NUTS-3 level
[2] In the ESPON territorial typology of mountainous regions at NUTS-3 level, Cuneo is referred as: "moderately mountainous regions under urban influence" while the three other provinces are referred as "areas not covered by classification".

3.1.2. Unemployment

Unemployment rate: Definition of the indicator by Eurostat
Regional (NUTS level 2) unemployment rate represents unemployed persons as a percentage of the economically active population (i.e. labour force or sum of employed and unemployed). The indicator is based on the EU Labour Force Survey. Unemployed persons comprise persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. currently available for work; 3. actively seeking work or who had found a job to start within a period of at most three months.

Unemployment rate (for the results published for the LAU level) is defined by ISTAT as follows: the percentage of the population aged 15 and over in search of employment divided by the labour force of the same age group. So, this definition (that we have used here) differs slightly from that of Eurostat.

As we have mentioned, there are data for Piedmont for both the NUTS-3 and the LAU-2 levels – for the latter only for 2001 (census year).

Variations at NUTS-3 and LAU-1 levels, territorial typologies

The difference of the unemployment rates' variations **among the LAU-2 and the NUTS-3 level** are considerable, as it results from the *Figure 3.1.2*a; the max and min values for the unemployment rate differ considerably, while the respective means differ a few. Also the difference of the Coefficients of variation at LAU-1 and NUTS-3 level is pronounced.

Specifically, the rates of the four NUTS-3 regions range between 3,9% and 7,2% which contrasts to a larger variation between the 873 LAU units that range between 0,4% and 15,4%. So the analysis at lower level can reveal that there are 92 municipalities with unemployment rates higher than 7,2% and 310 municipalities with rates below 3,9%.

The LAUs with the higher rates (above the average rate of Piedmont) are located in Torino, which is also the NUT3 with the highest rate in Piedmont, as for example Trausella (15,4) and Mattie (12,3). But there are also LAUs in the top 10 of high unemployment in other NUTS-3 region as for example Argentera (14,0) in Cuneo and Casaleggio Boiro (10,5) in Alessandria. This wouldn't be evident without an analysis on LAU level.

Regarding the analysis at the Piedmont **NUTS-3 level**, the more important "territorial" result is that unemployment rates were (in 2008) higher in the predominantly urban province of Torino (5,6%) than in the predominantly rural provinces of Cuneo, Asti and Alessandria (source of data: Eurostat).

See for the unemployment rate % in 2001 in Piedmont measured across LAUs within the NUTS-3 regions and the respective coefficients of variation in *Figure 3.1.2b.*

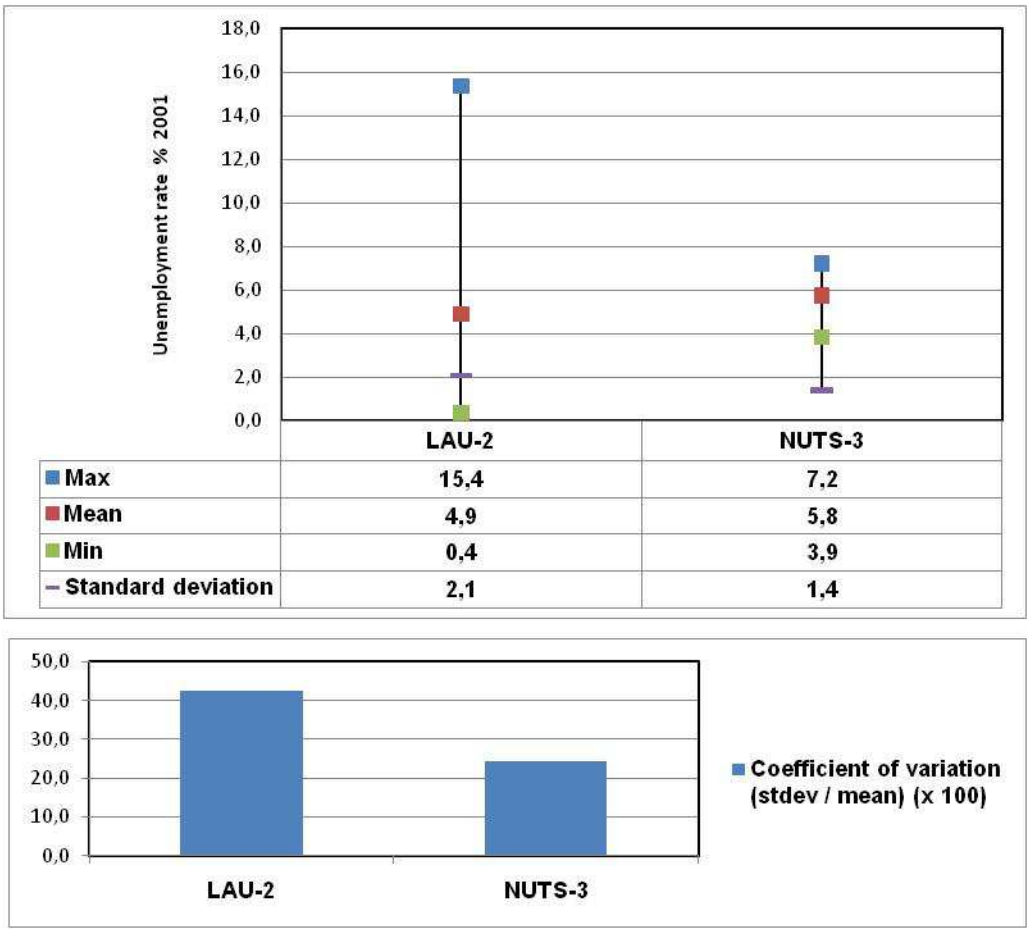


Figure 3.1.2a: Unemployment rate % in 2001 in Piedmont at NUTS-3 and LAU-2 levels: max, min, mean, standard deviation and Coefficient of variation

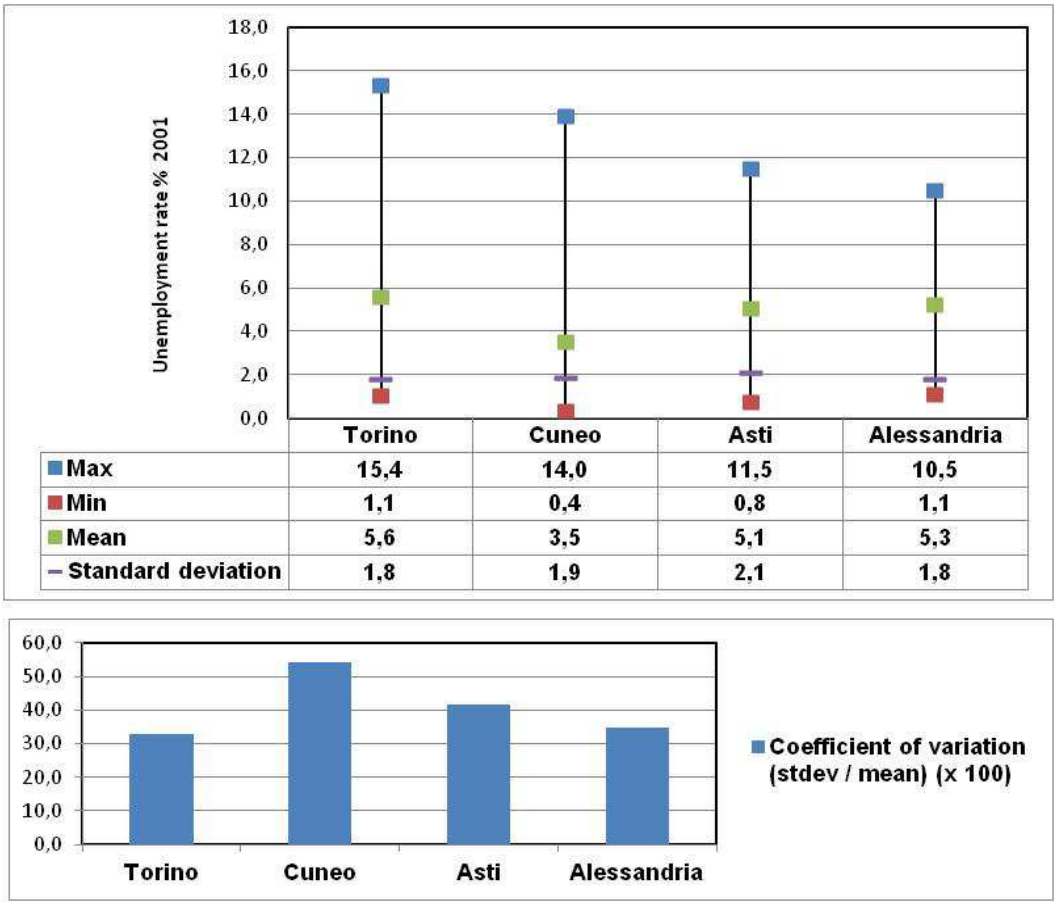
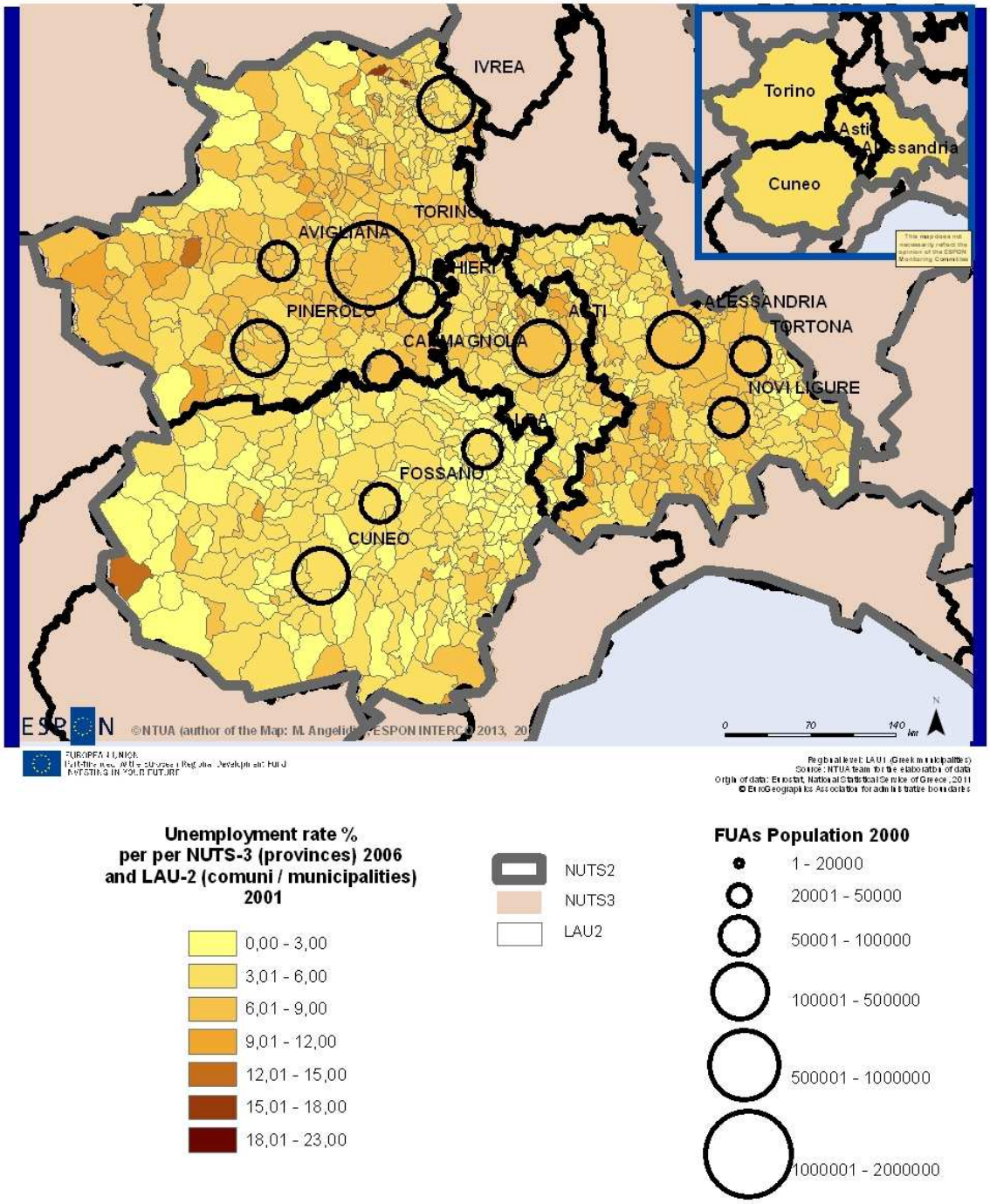


Figure 3.1.2b: Unemployment rate % in 2001 in Piedmont measured across LAUs within the NUTS-3 regions and coefficients of variation

The analysis at LAU level on the basis of the **mountainous** typology and the urban-rural one has revealed that the mountainous LAUs of Cuneo perform better as for the unemployment rates than the more urbanised LAUs of Torino and Alessandria –see the Map 3.1.1. However there are 17 LAUs of Cuneo that present unemployment rates above the average rate of Piedmont and four of them are among the top 10 with the highest numbers (Argentera, Igliano, Briaglia and Valmala). Also it can be seen that high unemployment rates are found both in rural LAUs like Aramengo (rate 11,5 and population around 600 inh.) and in LAUs including big metropolitan cities, like Torino (rate 8,4 and population over 860.000 inh.),

Therefore, *the disparities among the urban and rural as well as among the mountainous and the lowland areas of the region are much more clearly presented through the LAU level analysis.*



Map 3.1.2: Piedmont: Unemployment rate % per NUTS-3 (provinces) 2006 and LAU-2 (comuni) 2001

Source of data: Eurostat and NSO of Italy, author: M. Angelidis

3.2. Inclusion

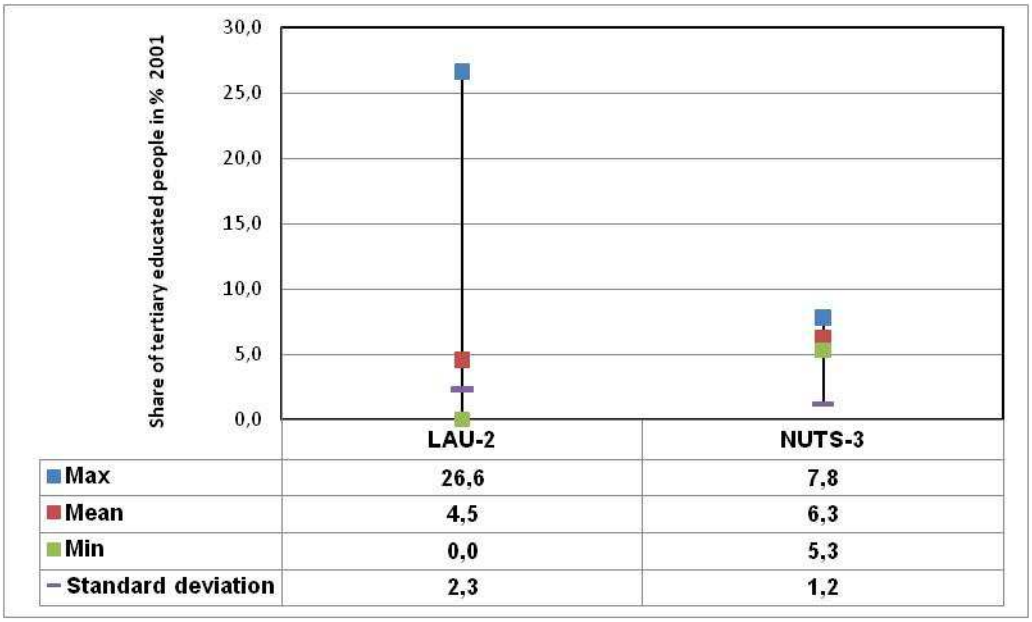
3.2.1. Share of tertiary educated people

Regarding the indicator “share of tertiary education %”, we used in the case of Piedmont, both at NUTS-3 and LAU-2 levels, aggregations of the data for: holders of doctorate, holders of Master, graduates of University level institutions, graduates of Technological Educational Institutes.

Variations at NUTS-3 and LAU-1 levels, territorial typologies

The difference of the share of tertiary educated people variations **among the LAU-2 and the NUTS-3 level** are considerable. More specifically, the rates of the four NUTS-3 regions range between 5,3% and 7,8% which contrasts to a larger variation between the 873 LAU units that range between 0 % and 26,6%. So the analysis at lower level can reveal that there are 65 municipalities with shares of tertiary educated people higher than 7,8% and 631 municipalities with shares below 5,3%.

Also for this indicator, the difference of the Coefficients of variation at LAU-2 and NUTS-3 level is pronounced – *see the Figures 3.2.1a and 3.2.1b and the Map 3.2.1.*



	LAU-2	NUTS-3
Max	26,6	7,8
Mean	4,5	6,3
Min	0,0	5,3
Standard deviation	2,3	1,2

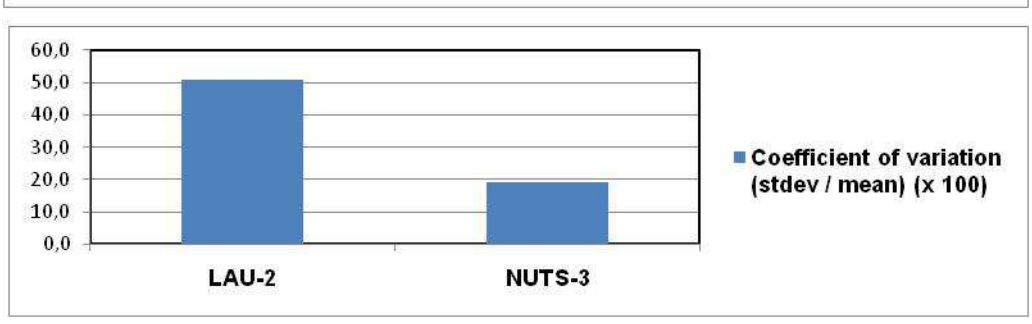
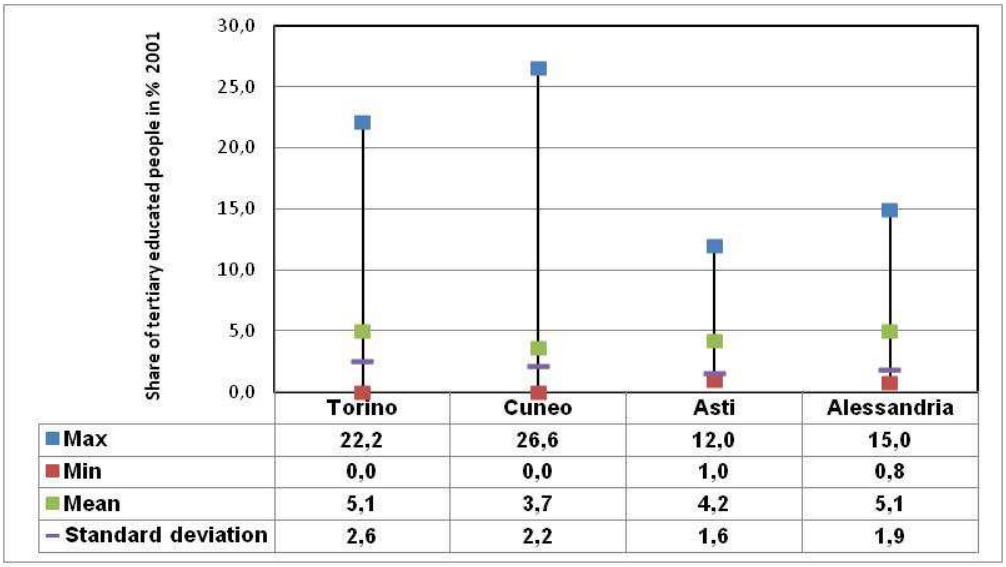


Figure 3.2.1a: Share of tertiary educated people % in Piedmont NUTS-3 and LAU-1 levels: max, min, mean, standard deviation and Coefficient of variation



	Torino	Cuneo	Asti	Alessandria
Max	22,2	26,6	12,0	15,0
Min	0,0	0,0	1,0	0,8
Mean	5,1	3,7	4,2	5,1
Standard deviation	2,6	2,2	1,6	1,9

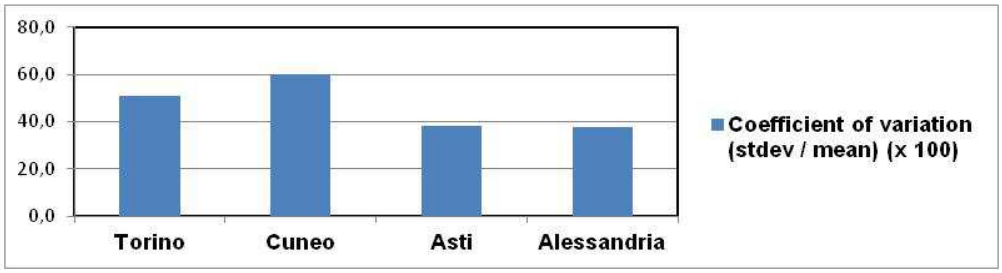


Figure 3.2.1b: Share of tertiary educated people (2001) measured across LAUs within the regions and coefficients of variation

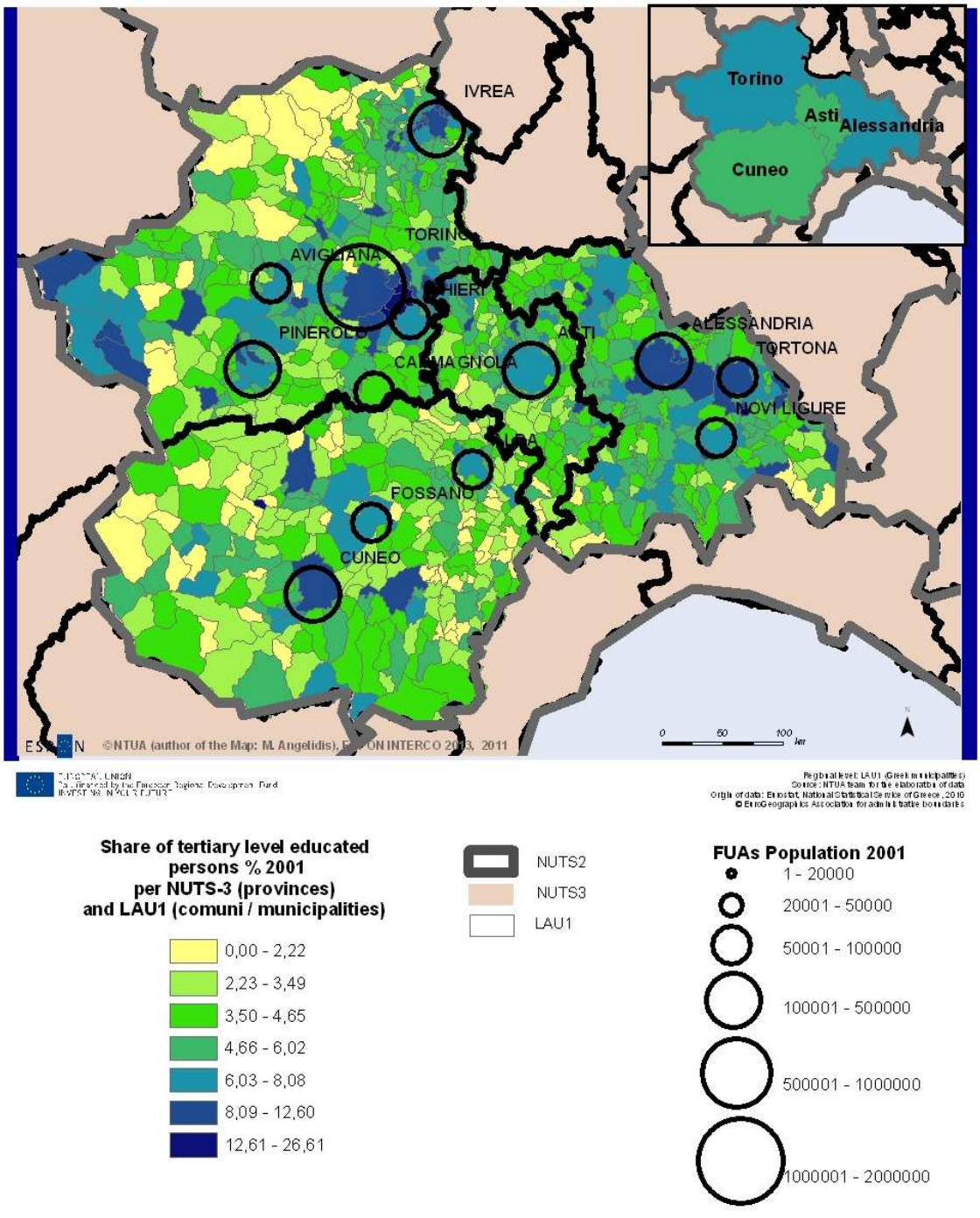
An interesting finding which is evident only through the analysis at LAU level, is that despite the fact that the province of Cuneo (NUTS-3) presents one of the lowest shares, it includes the LAU with the highest share (Isasca with 26,6%). Opposing to that, the province of Torino presents the highest share of tertiary educated people and includes two LAUs with the lowest shares (Ingria with 0% and Frassinetto with 0,4%).

The analysis at LAU level on the basis of the mountainous typology and the urban-rural one has revealed that the shares of tertiary educated people show very large fluctuations among the mountainous LAUs, which present lower shares and the lowland LAUs near the big metropolitan city of Torino or Alessandria, which present shares much higher –see the *Map 3.2.1*.

Complementary to that the disparities are very big between the LAUs which include or are close to all the FUAs in the region of Piedmont and the peripheral/ more distant LAUs.

However, there are a few exceptions in that pattern, as for example FUAs like Bardonecchia (8,2%), Sestriere (8,8%) and Sauze di Cesana (8,9%), included in the NUTS-3 – Torino, which are three of the most distant FUAs from the metropolitan city of Torino and present very high shares of tertiary educated people.

Therefore, *the disparities among the urban and rural as well as among the mountainous and the lowland areas of the region are much more clearly presented through the LAU level analysis.*



Map 3.2.1: Piedmont region: Share of tertiary educated people % LAU-2 and NUTS-3 2001, Functional Urban Areas (FUAs) population 2001

Source of data: Eurostat and ISTAT (NSO of Italy)

3.2.2. Population ageing

Variations at NUTS-3 and LAU-1 levels, territorial typologies

According to the *Figure 3.2.2a,* the minimum and maximum and also the average percentage of people 65+ years/ total population differ significantly, subject to the level of measurement (NUTS-3, LAU-2).

Also the difference of the Coefficients of variation at LAU-2 and NUTS-3 level is pronounced.

As it results from the Map 3.2.2, the disparities among the urban and rural and the mountainous / lowland areas of the region are clearly presented through the LAU-2 level analysis.

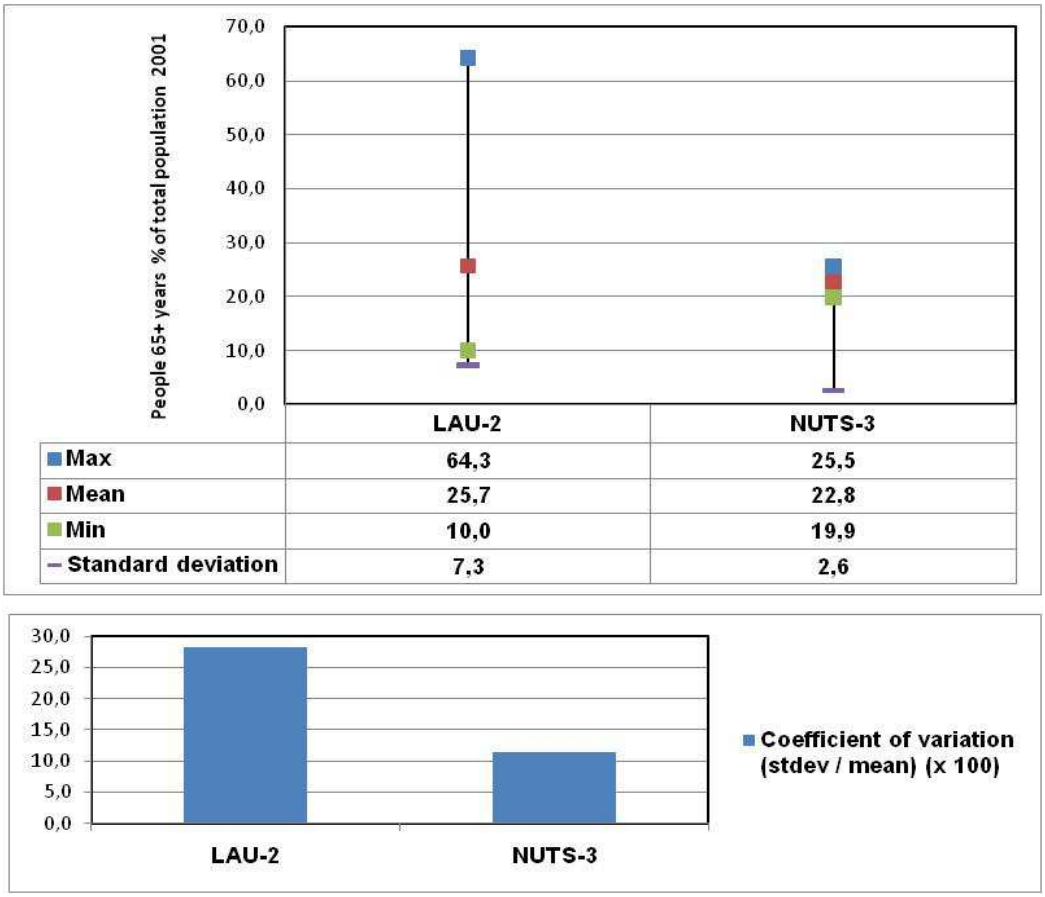


Figure 3.2.2a: People 65+ years % of total population 2001 in Piedmont at NUTS-3 and LAU-2 levels: max, min, mean, standard deviation and Coefficient of variation

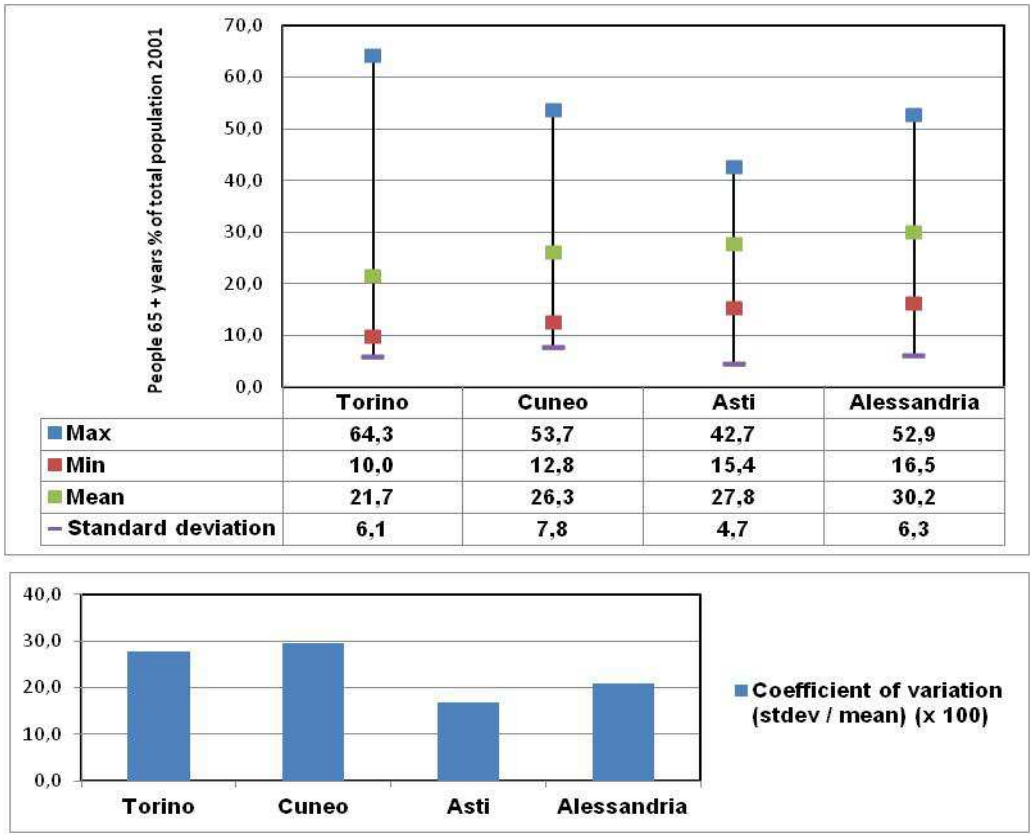
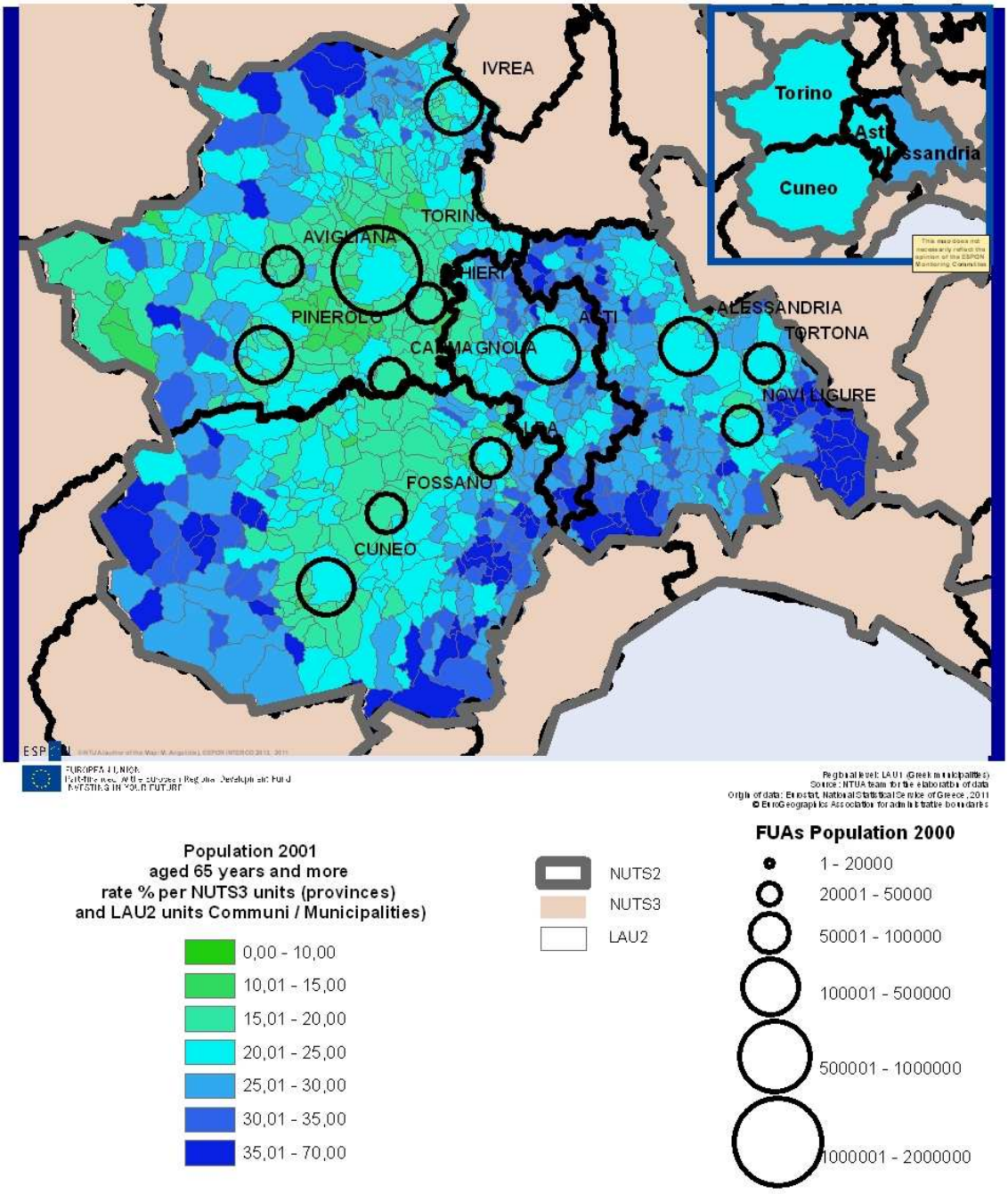


Figure 3.2.2b: People 65+ years % of total population (2001) in Piedmont measured across LAUs within the regions and coefficients of variation

As it is evident from the Map 3.2.2 the urban areas present lower ageing rates than LAUs in peripheral areas. However there is the exception of some distant western LAUs in the province of Torino that present low ageing rates (Sestriere with 10%, Sauze di Cesana with 14,5% etc) and are also characterized by high shares of tertiary educated people. Also a common pattern in the case study area is that the population in lowland areas is younger, while in mountainous areas the population is older.



Map 3.2.2: Piedmont: Ageing rate % (persons aged 65+ years / Total population) per NUTS-3 (provinces) LAU-2 (comuni) 2001

Source of data: Eurostat and NSO of Italy, author: M. Angelidis

3.2.3. Life expectancy

As we have mentioned, there are data for Piedmont on Life expectancy by sex only for the NUTS-2 level.

We give below the comments of DEMIFER 2010 for the territorial differentiation of Life expectancy by NUTS-3 units (provinces) of Piedmont and by sex – see also the table 3.2.3.

If we compare the 2007 life tables with those of 1992, we can see that in the provinces of Piedmont there has been a gain in Life Expectancy at Birth (LEB) for males of between 4.3 and 6.2 years, and for females of between 2.5 and 3.8 years. The gains in LEB have therefore been greater for males (+6,7%) than for females (+4,3%), but for both genders the gain increases with age, so that male life expectancy at age 60 is 10% higher and for females at the same age it is 5% higher. The variability between male in the various provinces of Piedmont decreased, but it increased for women.

Table 3.2.3: Death rate and Life Expectancy at Birth (LE) by gender in the Piedmont region and its provinces(included in this case study)

Reference areas, Region, Provinces	Death rate (‰)		Male LEB (yrs)		Female LEB (yrs)	
	1992-2001	2002-2009	1992	2007	1992	2007
ITALY	***9.8***	***9.7***	***74.0***	***78.7***	***80.6***	***84.0***
North-West Italy	***10.6***	***10.2***	***73.3***	***78.8***	***80.7***	***84.3***
Piedmont	**11.5**	**11.2**	**73.6**	**78.5**	**80.6**	**84.1**
Torino	10.1	10.1	74.0	78.8	80.8	84.6
Cuneo	12.3	11.6	73.5	78.3	80.5	83.9
Asti	14.1	13.0	74.1	79.1	79.8	83.0
Alessandria	15.2	14.1	73.6	77.9	80.6	83.8
Province variability (100xCV)	*12.23*	*13.10*	*0.92*	*0.76*	*0.44*	*0.65*

Source of the Table DEMIFER 2010: Elaborations of data from the ISTAT database available at http://demo.istat.it/.

3.2.4. Population density

Population density: Definition of the indicator by Eurostat

Population density is the ratio between (total) population and surface (land) area

Variations at NUTS-3 and LAU-1 levels, territorial typologies

The minimum and maximum and also the average population density differ significantly, at LAU-2 level compared with NUTS-3 level, indicating at LAU-2 that there are both areas which have very low population density and dense urban areas –*Figure 3.2.4a.* Also the difference of the Coefficients of variation at LAU-2 and NUTS-3 level is very big.
In more detail: the densities between the four NUTS-3 regions range between 81 (inh./Km2) and 317 which contrasts to a much larger variation between the 873 LAU units that extend between 1 and 6647.

The LAUs with the higher densities are Torino (6647) and Grugliasco (2952), both located in the NUT-3 region with the highest density (Torino) which is expected because this is the only metropolitan province of Piedmont and the highest densities are normally found in this area. The interesting thing in this case is that in the NUTS-3 region of Torino are also found some of the lowest densities as for example in Ceresole Reale (2) and Valprato Soana (2). These substantial differences wouldn't be evident without an analysis at LAU level.

See for the population density 2001 in Piedmont measured across LAUs within the NUTS-3 regions and the respective coefficients of variation in *Figure 3.2.4b.*

The analysis at LAU level on the basis of the **mountainous** typology and the urban-rural one has revealed that the population density shows very large fluctuations among the mountainous LAUs, which present very low densities (they are almost uninhabited), and the lowland LAUs near the big metropolitan city of Torino, which present densities much higher –see the *Map 3.2.4*.

Complementary to that the disparities are enormous between the LAUs which include or are close to all the FUAs in the region of Piedmont and the peripheral/ more distant LAUs.

Therefore, *the disparities among the urban and rural as well as among the mountainous and the lowland areas of the region are much more clearly presented through the LAU level analysis.*

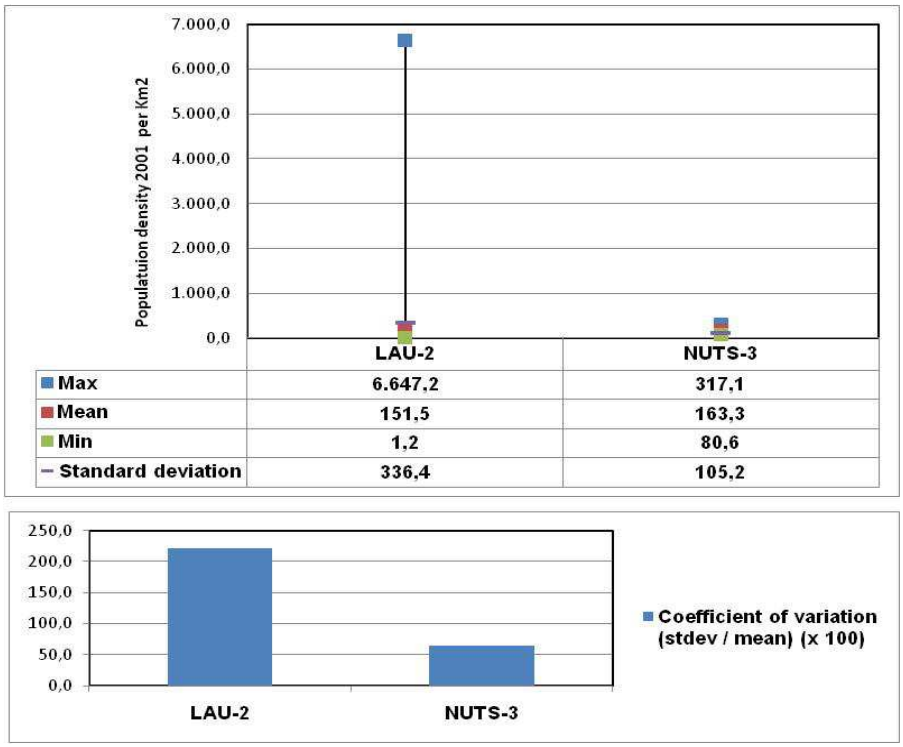


Figure 3.2.4a: Population density 2001 per Km2 in Piedmont at NUTS-3 and LAU-2 levels: max, min, mean, standard deviation and Coefficient of variation

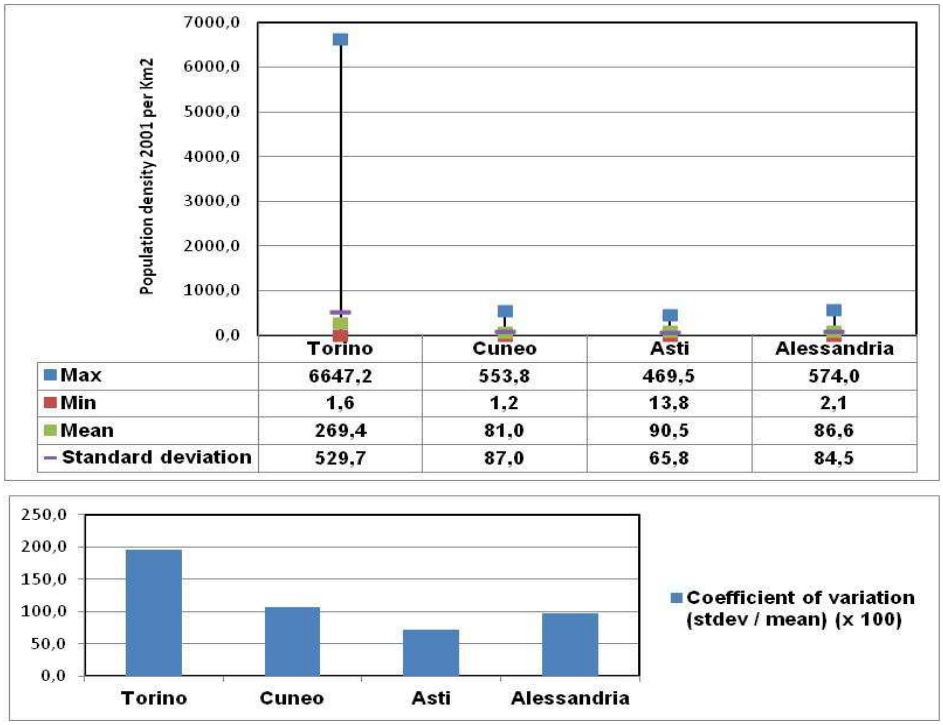
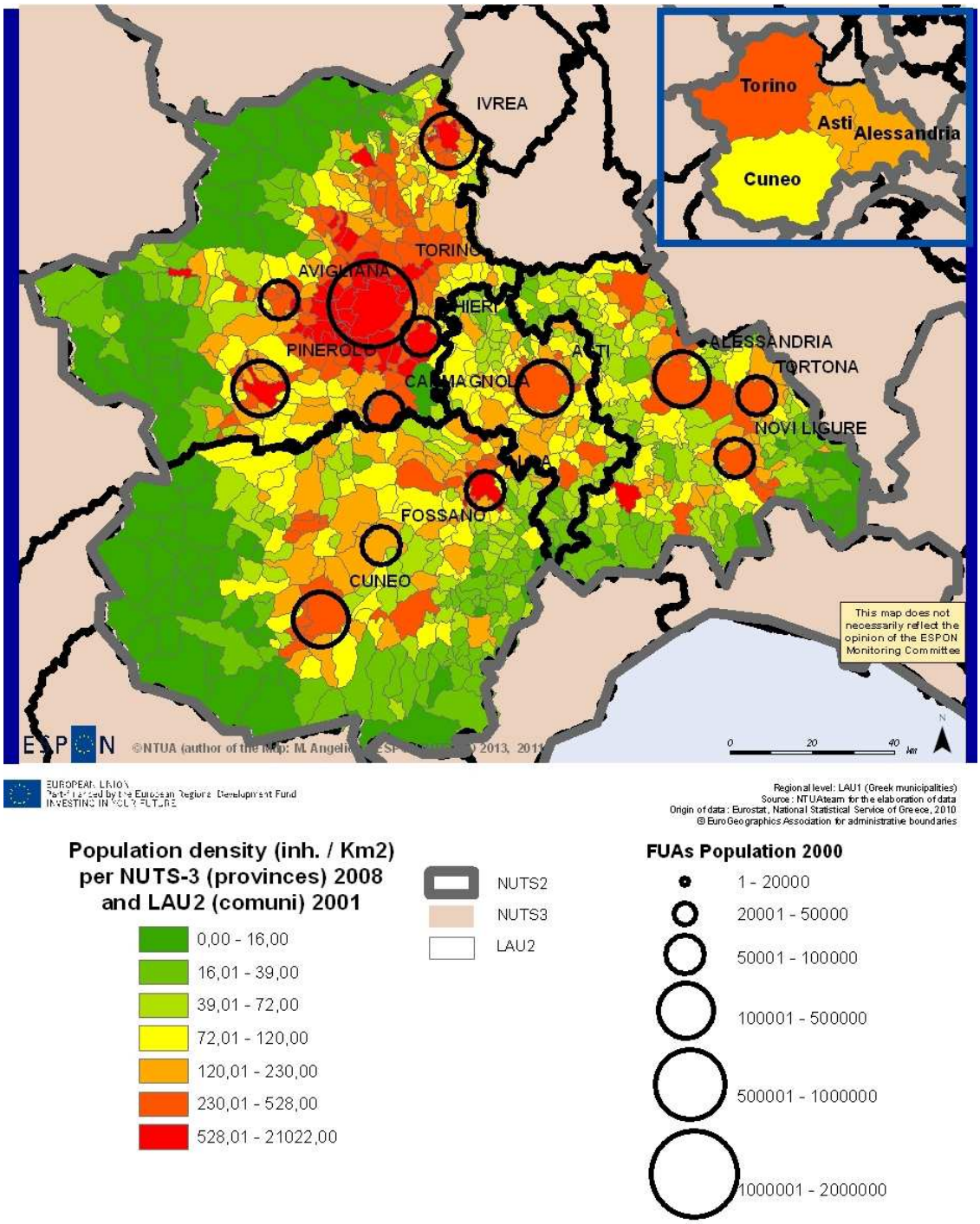


Figure 3.2.4b: Population density per Km2 (2001) in Piedmont measured across LAUs within the regions and coefficients of variation



Map 3.2.4: Piedmont region: NUTS-3 (provinces) and LAU-2 (comuni) population density 2001, Functional Urban Areas (FUAs) population 2001

Source of data: Eurostat and NSO of Italy, author of the Map: M. Angelidis

3.2.5. Population growth

Variations at NUTS-3 and LAU-1 levels, territorial typologies

According to the *Figure 3.2.5a,* the minimum and maximum and also the average percentage of population change (growth) differ significantly, subject to the level of measurement (NUTS-3, LAU-2).

Also the difference of the Coefficients of variation at LAU-2 and NUTS-3 level is pronounced.

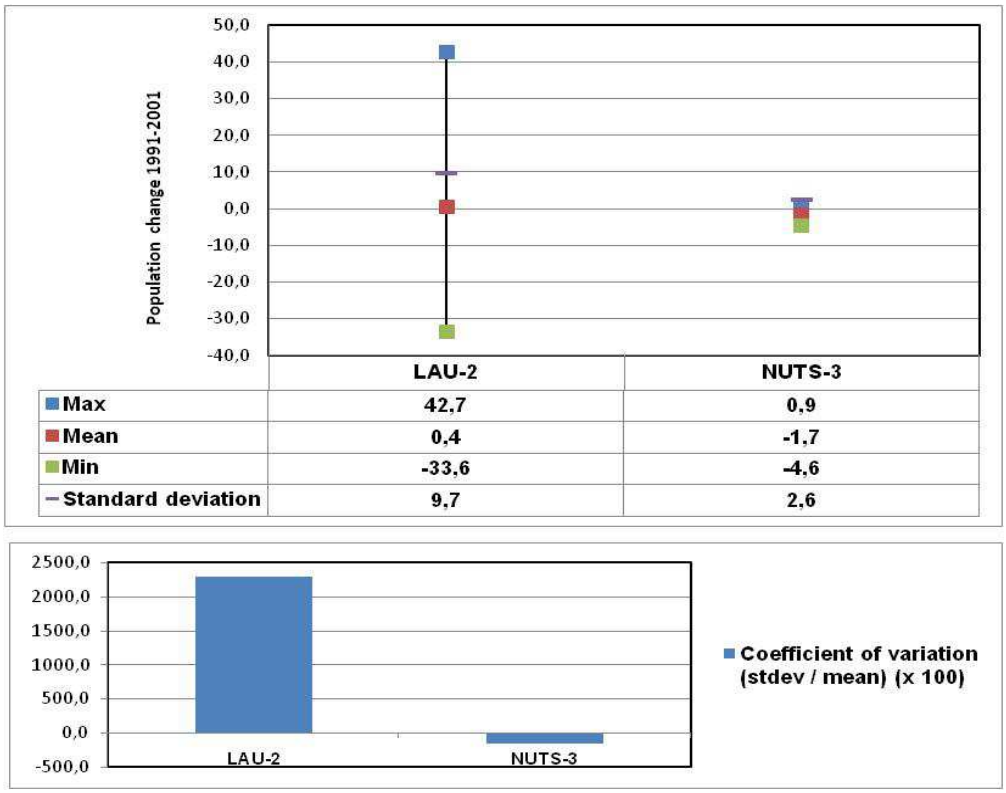


Figure 3.2.5: Population change (%) from 1991 to 2001 in Piedmont at NUTS-3 and LAU-2 levels: max, min, mean, standard deviation and Coefficient of variation

As it results from the *Map 3.2.5* (see also the Map 1.2.1), the disparities on population change among the urban and rural and the mountainous / lowland areas of the region are very clearly presented through the LAU-2 level analysis.

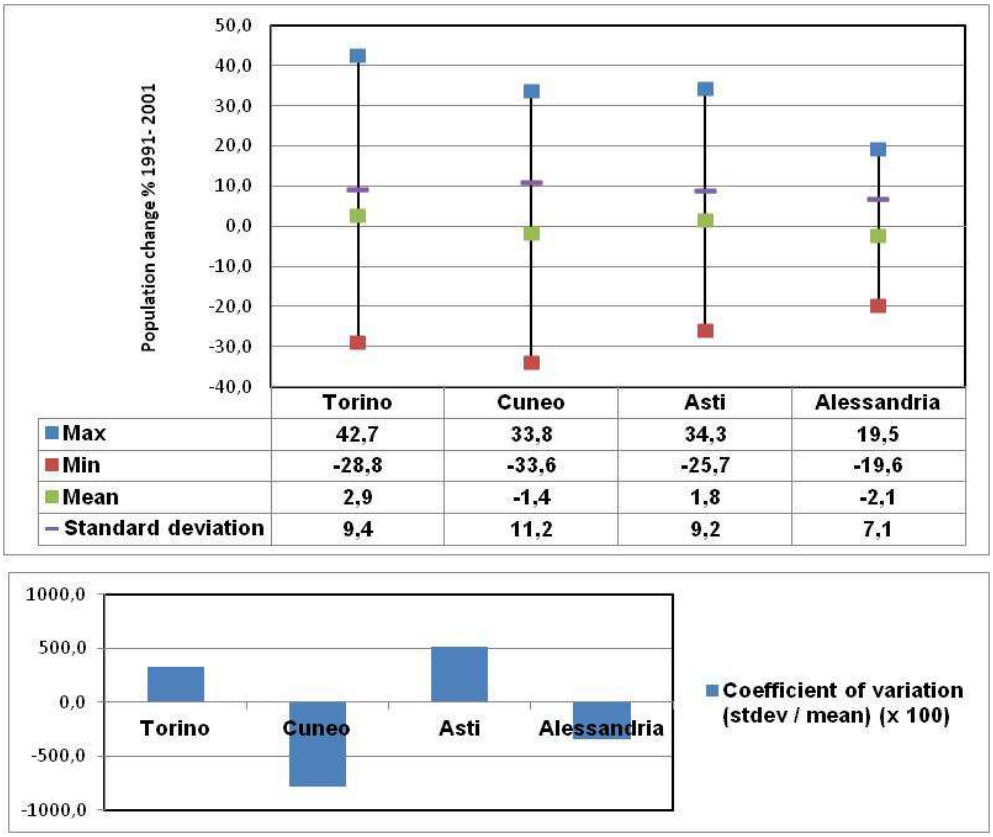
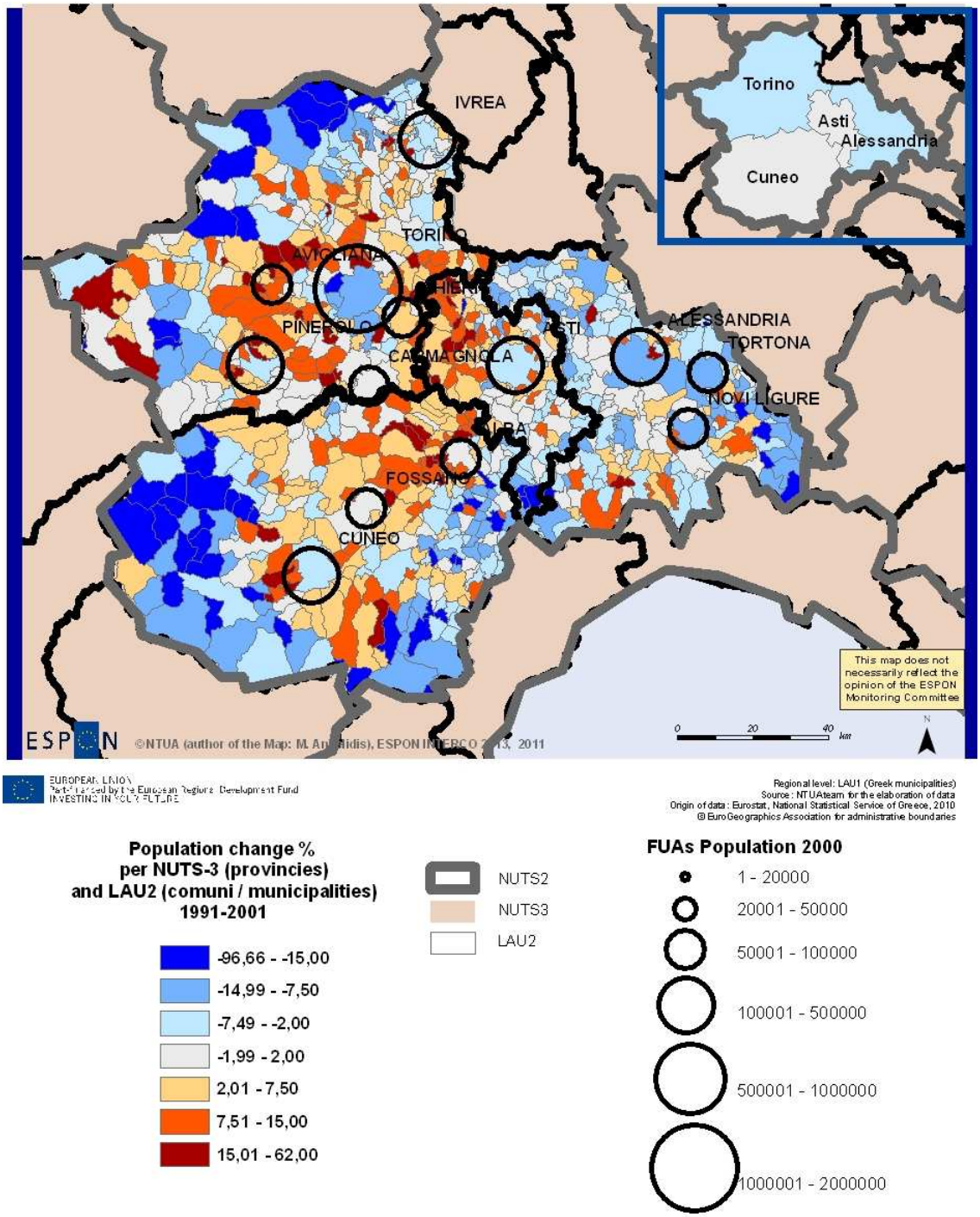


Figure 4: Population change % (1991- 2001) measured across LAUs within the regions and coefficients of variation



Map 3.2.5: Piedmont: Population change % 1991-2001 per NUTS-3 (provinces) and LAU-2 (comuni / municipalities)

Source of data: Eurostat and NS of Italy, author of the Map: M. Angelidis

4. Geographically specific /local conditions indicators in the case study

In the section 2 we have presented the indicators for which there are available data for the case of Piedmont at LAU level. This refers to data published by ISTAT –which can be found online directly or online in .pdf format.

However, it is possible to have data for other indicators, for instance migration, using a procedure of specific request to the ISTAT. These data correspond to the censuses of 1991 and 2001.

Finally, it should be stressed that datasets useful to measure crucial National and EU concepts at a local (LAU) level in Piedmont regarding for instance business development are provided by NUTS-3 level Chambers

5. Key findings and conclusions

The case study area of Piedmont (NUTS-2 level) is situated in the north-western part of Italy.

It includes four important cities and a wide number of urban LAUs (municipalities). Piedmont can be hardly defined as a “monocentric” region. Many of the capital cities of its eight NUTS-3 regions (provinces), as well as some other towns, maintain their economic importance that is often based on specific industrial activities or agricultural production although Piedmont is undoubtedly a region in “industrial transition”.

In this study we have decided to include only the Piedmont’s NUTS-3 regions of Torino, Cuneo, Asti and Alessandria because this area enables us to analyse the inequalities among a big metropolitan region (Torino) and its periphery, among the urban NUTS-3 region of Torino and the three predominately rural NUTS-3 regions (Cuneo, Asti and Alessandria), as well as those among mountainous and lowland areas.

The NUTS-3 region of Torino maintains a strong neo-industrial identity and plays the role of international gateway for Piedmont. The coastal area of Alessandria has a location on the borders with the Genoa area and a harbour which makes it particularly appropriate for logistic activities. The agricultural area of Asti and the mountainous one of Cuneo are dominated by the agro-industrial industry and their spatial organization is based on a highly cohesive network of medium-sized cities.

The analysis, using several types of statistics of variation (min / max, mean (average), standard deviation and coefficient of variation) at NUTS-3 and LAU level has shown that the values for all the feasible TC indicators tested (unemployment rate, share of tertiary educated people, ageing index, population density and population growth) differ significantly at LAU level compared to NUTS-3 level. The coefficients of variation (which is the more appropriate statistic for this issue) are clearly higher at local level, implying therefore a broader level of complexity of the indicators at this level.

The analysis at LAU level has revealed important disparities in respect of all the ESPON **territorial typologies** (applying to the region) and all the indicators used. Regarding unemployment rates, the **mountainous** LAUs of Cuneo perform better than

the **more urbanized** ones of Torino and Alessandria. Complementary to that, population ageing is higher in the peripheral and mountainous LAUs revealing great disparities in comparison to the more urban and close to the **metropolitan** area of Torino LAUs. This pattern also applies to the share of tertiary educated people. Finally, the density of the population shows very large fluctuations among the mountainous LAUs-which present very low densities-and the LAUs near the big metropolitan city of Torino, which present much higher densities.

Figures at local level were also able to illustrate strong **disparities inside single NUTS-3 regions** depending on its settlement structure. For instance, inside the big metropolitan region of Torino the peripheral areas show a totally different territorial pattern from the areas close to the city of Torino and perform differently in all the indicators tested (lower unemployment and share of tertiary educated people, higher ageing rates and negative population change)

The analysis at a local level also allowed us to identify that local areas which performs weaker as for some important dimensions of Territorial Cohesion are not exclusively restricted to peripheral or rural sparsely populated areas but on the contrary are also found around major urban centres: for instance LAUs with high shares of tertiary educated people are not only found in the LAUs which include FUAs, but are also presented in some of the most distant areas in the region of Torino and some areas in the mountainous region of Cuneo. It was also found that average regional figures are unable to show exceptional local situations.

It should also be stressed that datasets useful to measure crucial National and EU concepts at a local (LAU) level in Piedmont regarding for instance business development are provided and regularly updated at NUTS-2 / NUTS-3 levels.

Finally, the study of the Piedmont case has also demonstrated that “really territorial” aspects of cohesion could not be appropriately analysed using indicators at NUTS-3 level. The use of local indicators at LAU level could be very useful by complementing the latter analyses.

Regarding specifically the **data availability and quality for the INTERCO headline indicators at local (LAU) level**, the results for the case of Piedmont was in general terms satisfactory. There are data at LAU level for Piedmont for a considerable number of INTERCO headline indicators (8 out of 27). However, for some indicators (for instance: income and poverty), the harmonisation of the respective values for all the case studies is very difficult, because the implementation of the definitions of the respective indicators made by each EU country are probably very different. To a smaller extent, this is the case even for indicators such as unemployment where the definition used for the elaboration and publication of the national censuses data at LAU (local) level until the 2001 census round differ slightly from this one used by Eurostat. Therefore, as a respective policy recommendation, Eurostat should emphasise on the harmonisation of the definitions used for the “local” INTERCO headline TC indicators that we have mentioned, with emphasis in the national census rounds.

As a general conclusion, the study of the Piedmont case has demonstrated that “really territorial” aspects of cohesion could not be appropriately analysed using indicators at

NUTS-3 level. The use of local indicators at LAU level could be very useful by complementing the latter analyses.

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- *Tables and data* for *all the indicators used* 1991 – 2009 (EU level, NUTS-0 to NUTS-3 levels for Italy and Piedmont)

- *Tables and data from the 1991 and 2001 censuses at NUTS-3 and LAU levels for Piedmont* www.istat.gr (data from the ISTAT database and from documents in pdf)

The ESPON 2013 Programme

INTERCO

Indicators of Territorial Cohesion

Scientific Platform and Tools Project 2013/3/2

Annex 7

Thessalia

(Greece)

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Abbreviations

EU-27: 27 Member States of the European Union
GDP: Gross Domestic Product
GDP PPS: GDP in Purchasing Parities Standard
GSA: Greek Statistical Authority (created on 2010)
NSSG National Statistical Service of Greece (before 2010)
NUTS Nomenclature of Territorial Units for Statistics
TC: Territorial Cohesion

Objectives

The objective of the case studies is to locally explore the Headline indicators defined in the framework of the Interco Project as a way to characterize local situations.

The analysis of the feasible indicators is intended to show that higher spatial inequalities are revealed when going beyond the traditional NUTS 3 level of study. Territories which seem to have certain level of spatial disparities in the traditional NUTS-3 level of analysis might register other degrees of disparities/inequalities at a local level. The idea is to observe if the analyses at LAU level bring important new insights regarding TC patterns at NUTS 3 level as well as differences between them.

Additionally to this it is of interest to identify indicators available in the local case-studies that do not exist at the EU regional level but that might be of interest for the other levels in the framework of Territorial Cohesion.

Summarising, the main objective is to create awareness of the existence of another spatial layer/level of study additional (and complementary) to the traditional NUTS 2-3 scales, where more complex spatial patterns exist but seem to be imperceptible in the traditional way of displaying indicators on the basis of these regional scales.

The local level is not intended to substitute or compete with other scales of analysis, but rather is intended to open a dialogue between different scales that increasingly overlap temporally and spatially. It is intended to serve as a complement to other scales, as a contributor to decipher the complexity of territorial cohesion.

1. Case study introduction

1.1. General features

The **region of Thessalia** (GR14 – NUTS2 level) is situated in the central - eastern part of the mainland Greece -*see in the Map 1.1.1*- and its **area** (14.037 km²) amounts in 10.6% of the total of Greece.

Map 1.1.1: Situation of Thessalia in Greece

Thessalia occupies the east side of the Pindus watershed, extending south of Macedonia to the Aegean Sea. The northern tier of Thessalia is defined by a generally southwest-northeast spur of the Pindus Range that includes Mt. Olympus, close to the Macedonian border. Within that broken spur of mountains are several basins and river valleys. The easternmost extremity of the spur extends south-eastward from Mt. Olympus along the Aegean coast, terminating in the Magnesia Peninsula that envelops the Pagasetic Gulf and forms an inlet of the Aegean Sea (Wikipedia 2010). Thessalia's major river, the Pineios, flows eastward from the central Pindus Range just south of the spur, emptying into the Gulf of Thermaikos[1].

In summary, the **physical-geographical morphology** *of Thessalia,* with an extended lowland part which forms an important central plain (situated mainly in the prefectures of Trikala, Karditsa and Larisa) surrounded by mountainous bulges and, in the Eastern, the contact with Aegean Sea, *favours its internal territorial integration.*

The **population** *of Thessalia in 2009 (735,885 inhabitants) amounted to 6.5% of the total population of Greece* (Eurostat 2010). Its *population density in 2009 - 52.4 inhabitants / km²*- is slightly lower than that of Greece: 83 inhabitants / km2.

Thessalia is located in the main developmental and transport (road, rail) axis of the country: Patrai - Athens - Thessaloniki - Northern borders. Its distance from the two big developmental centres of Athens and Thessaloniki is, 3,5-4,0 and 1,5-2,5 hours, respectively (allowing same-day trips from and to the region). In a relatively small distance from its northern border, Egnatia highway will presumably become the major developmental axis of Western to Eastern Greece. Consequently, Thessalia is located in a strategic and easily accessible geographical position.

[1] This paragraph is partly compiled from ESPON DEMIFER 2010

The *rural sector of Thessalia* continues to have an important share in the *composition of the region's economy* (it covers roughly the 35% of the GDP and the 39% of the employment), despite the fact that it has shrunk during the last decades. The most important agricultural products are the hard wheat and the cotton, however important extents are also occupied by the remaining cereals, tobacco, arboraceous cultivations and the vines. In the livestock-farming there are, also, recorded important sizes of livestock while the production of cheese is very important. Structural changes attempted during the last years, such as the restructuring of the composition of the production in favour of more competitive products, grouping of farmers etc, were not completed. Despite this even unaccomplished modernisation, *Thessalia's agriculture remains labour force intensive.*

Industry, once very powerful in the region, especially in Volos, is limited permanently. Especially, the share of big industrial units in the entire sector was limited with corresponding consequences in the employment. *Tourism* is developing, mainly in the coastal areas of the region. The entire *service sector* is growing in terms of GDP and employment; however, the most important growth concerns services related to the construction, restaurants, health and education as well as public services, while the share of the most dynamic brunches of services such as the services to the enterprises remains week.

1.2. NUTS / LAU level classification

According to the Eurostat NUTS / LAU classification (see in EU RAMON NUTS 2011) Greece is divided into 13 NUTS-2 units (regions – "perifereies" in Greek), 52 NUTS-3 units (prefectures – "nomoi" in Greek), 1000 LAU-1 units approximately (Municipalities and Communes) and 5.000 LAU-2 units approximately (Municipalities and Communes before 1997).

In 1997 the 5.000 small Municipalities and Communes of Greece were grouped in 1.000 bigger municipalities (and a limited number of Communes).

Very recently, on the base of the *Plan "Kallikratis"* which was adopted in *June 2010* and went into force from the *beginning of 2011*, the 1.000 Municipalities of the country (LAU) were grouped in 335 more powerful Municipalities. Also, the self –governed prefectures (NUTS-3) became sub-divisions of the since then self-governed Regions (NUTS-2). See for the "Kallikratis" municipalities of Thessalia *in Table 1.2.1*

However, since it is decided that the division of the Greek spatial units according to the EU NUTS / LAU system of territorial division for statistics (see in the site RAMON NUTS) will remain unchanged until 31-12-2011, **we will not take into account the recent reform of the Greek administrative system on the base of the Plan "Kallikratis".**

So, Thessalia includes actually **four NUTS-3 level** units: the *prefectures* (Greek "nomoi" –called from 2011: "regional units") *of Karditsa, Larisa, Magnesia and Trikala*, They are divided in **104 LAU-1 units (**which correspond to the former 93 Municipalities and 11 Communes before the Plan "Kallikratis") – *see in the Map 1.2.1.*

As from 1997 and beyond there are few data at LAU-2 level (in practice, there are only data for the number of inhabitants), we decided to work at LAU-1 level.

Table 1.2.1: Municipalities of Thessalia according to the "Plan Kallikratis" (applied from 2010): Population 2001 and 2011, area and density 2011

LAU2 name	NUTS-3	Population 2001	Population 2011	Area - Km2	Density 2011 - inh/Km2
Larissa	Larissa	145981	163380	335,96	486,28
Volos	Magnesia	142923	144420	385,04	374,52
Trikala	Trikala	78817	80900	608,71	133,15
Karditsa	Karditsa	57089	56460	651,78	87,21
Elassona	Larissa	35358	32110	1567,34	20,52
Tyrnavos	Larissa	25864	24970	525,90	47,53
Kalampaka	Trikala	22853	21280	1657,00	12,83
Kileler	Larissa	22719	21040	976,71	21,55
Sofades	Karditsa	21759	18910	720,73	26,24
Farsala	Larissa	23675	18650	739,60	25,21
Almyros	Magnesia	20139	18260	908,84	20,17
Palamas	Karditsa	18500	16730	381,95	43,71
Pyli	Trikala	15886	14210	751,52	18,97
Farkadona	Trikala	15133	13310	368,86	36,10
Mouzaki	Karditsa	16407	13090	313,27	41,71
Tempi	Larissa	15439	12830	575,96	22,25
Agia	Larissa	13120	11440	664,13	17,29
Rigas Feraios	Magnesia	11830	10970	549,76	19,92
Notiou Peliou	Magnesia	10745	10320	369,99	28,00
Skiathos	Magnesia	5788	6110	49,45	122,45
Skiathos	Magnesia	5788	6110	49,45	122,45
Zagora-Mouresi	Magnesia	6449	5830	150,28	38,79
Skopelos	Magnesia	4706	4830	95,95	37,27
Lake Plastiras	Karditsa	4022	4520	196,76	22,79
Argithea	Karditsa	2488	3360	373,50	9,01
Alonnisos	Magnesia	2425	2800	129,81	29,08

Source of data: GSA 2011. For the population 2011: provisional data of the population census 2011
We emphasise that these municipalities are not further taken into account because they do not correspond actually to LAU units according to the Eurostat RAMON – see previously

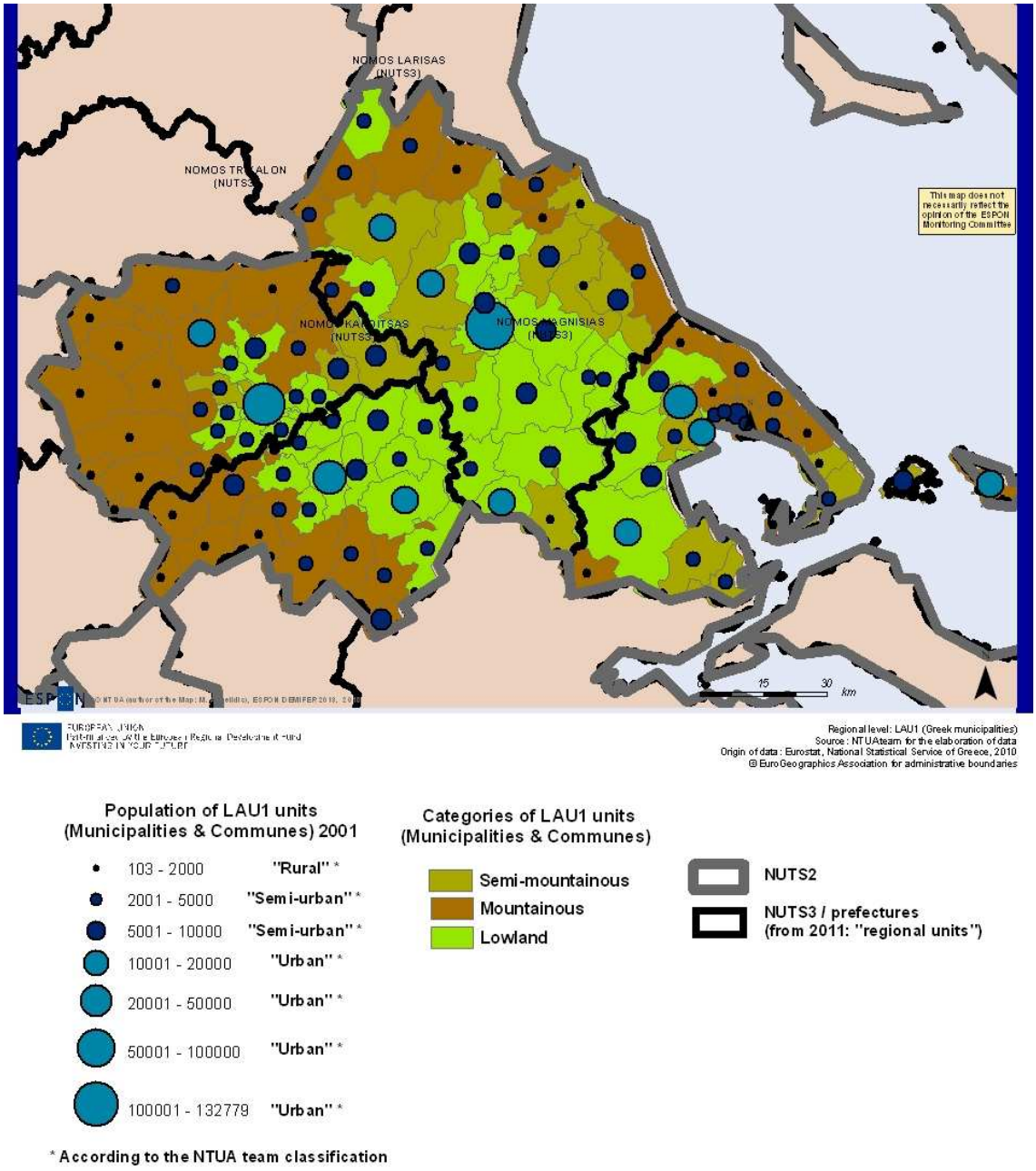
1.3. Territorial typologies

In order the following case study analysis be representative at European level as much as possible, it is worthwhile to refer to a "mega-region" typology for the EU level as well as to territorial typologies at NUTS-3 and LAU level.

As for the "mega-region" typology for the EU level, we could point out, in general terms that the study area of Thessalia belongs to the type of European South territories

Regarding the **NUTS-3 level**, we could refer to the ESPON territorial typologies (see in next). We should note that these typologies regard only the NUTS-3 level –not the NUTS-2 level.

As for the **urban-rural typology**, Thessalia includes one intermediate NUTS-3 region - close to a city (Magnesia), one predominately rural NUTS-3 region - close to a city (Larisa) and two predominately rural NUTS-3 regions - remote (Karditsa, Trikala).



Map 1.2.1: Settlements' network structure of Thessalia: Population 2001 by Municipalities (LAU1) classified (by NSSG) in mountainous / semi-mountainous / lowland and urban / semi-urban / rural

Source of data: Eurostat and NSO of Greece, author of the Map: M. Angelidis

Thessalia also includes one predominantly **mountainous** region under urban influence (Magnesia), two moderately mountainous-remote regions (Karditsa, Trikala) and one moderately mountainous region under urban influence (Larisa).

Finally it includes one NUTS-3 region which is characterized as a **coastal** region with a low share of coastal population (Larisa) and one NUTS-3 region which is characterized as a coastal region with a very high share of coastal population (Magnesia).

Regarding the **LAU level:**

Greek Statistical Authority (GSA)[2] classifies, since 2001, LAU2 units (Municipalities and Communes) the most populated settlement of which has less 2.000 inhabitants as "rural" and the rest as "urban". Before 2001 it classified as *"rural", "semi-urban" and "urban*", the LAU2 units the most populated settlement of which had *less than 2,000 inhabitants, 2,000 –10,000 inhabitants and more than 10,000 inhabitants,* respectively.

As we work here up to the LAU1 level (municipalities, communes), we simulated as "urban" the LAU1 units (municipalities) of Thessalia with more than 2.000 inhabitants, those with 2.000-10.000 inhabitants as "semi-urban" and the rest as "rural –see in the *Map 1.2.1.*

On the basis of this simulation, 14 LAU1 units of Thessalia were urban in 2001 while 49 were semi-urban and 24 were rural. The "urban" population surpasses the "rural" population.

Further on, on the basis of the population of the LAU-1 units, the region's **settlements' network** -*see in the Table 1.1.1 and the Map 1.2.1*- includes:

- Two relatively large cities: Larisa and Volos –about 163,400 and 144,400 inhabitants in 2011[3], respectively-, and

- Two medium sized cities: Trikala and Karditsa, with about 80.800 and 56,500 inhabitants, respectively.

It also includes 15 small cities with population ranging between about 10,000 and 32,000 inhabitants in 2101, a large number of which are centres of rural territories.

Larisa and Volos, the most important urban centres of the region, form a *"bi-pole"* that has a capital city role in the spatial planning of the country.

This urban network is *cohesive* to a considerable degree as the small cities are closely related to the four big cities.

Regarding the classification of the LAU units in **mountainous** / non-mountainous: GSA[4] classifies also the Greek LAU-2 units ("dimotika diamerismata") in *mountainous*[5]*, semi-mountainous*[6] *and lowland*[7]***.*** As we work here up to the LAU1 level (municipalities, communes), we simulated as "mountainous" the LAU1 units (municipalities) of Thessalia whose area is, in its larger part, mountainous. Similarly we characterised the rest LAU-1 units as "semi-mountainous" or "lowland" –see in the *Map 1.2.1.*

[2] "National Statistical Service of Greece (NSSG)" before 2010

[3] Resident population of Municipalities. The population of 2011 of the municipalities (as they have been reformed with the Plan "Kallikratis" (2010 – see in next) is taken from the preliminary results of the 2011 population census; therefore it is not fully comparable with the population of the 2001 census.

[4] which has successes NSSG

[5] NSSG definition of the Mountainous LAU2 units: Settlements with slopping and uneven surface, broken by ravines and covered by steep mountains which create deep and multiple folds with elevation differences over 400 metres as well as settlements whose entire surface or the bulk of this lies at an altitude above 800 meters above sea level.

[6] NSSG definition of the Semi - mountainous LAU2 units: Settlements who are located in the foot of mountains or whose area is shared by half in the plain and by the other half in the mountain, but always with altitude below 800 metres in their larger part.

[7] See for the NSSG definition of the LAU2 units in the published results of the population censuses 1991 and 2001.

On the basis of this simulation, 46 LAU-1 units of Thessalia are mountainous, 20 are semi-mountainous while 43 are lowland. It is clear that the bigger in population LAU-1 units (municipalities) in 2001 are lowland.

It is useful to remark here that on July 2011 have been published preliminary results of the population **census of May 2011**[8]. The respective data (at LAU-1 / municipality level) refer only to the total population, the composition of the population per sex, the area and the density. As they are not fully checked, they are not fully compatible with the 2001 census data.

However, taking into account the previous remark on the degree of compatibility of the 2001 and 2011 population data, we could remark that:

- The population of the three bigger municipalities (Larissa, Volos and Trikala) has increased from 2001 to 2011 (the increase was more important in Larissa) while the population of the less urbanised municipality of Karditsa has decreased.

- The population of almost all the other municipalities, the majority of which is rural or semi – rural has decreased. Only the population of the touristic island or coastal municipalities has increased.

2. Data availability in the case study

We examined the **feasibility of the INTERCO headline indicators as for the data availability at LAU-1 level in the case of Thessalia region**. As it is presented in the **Table 2.1** there are available data at LAU-1 level for Thessalia region for the following indicators:

(1) Population, unemployment, level of education

- Ageing index, dependency rate, population average annual growth

- Share of tertiary educated people in %

- Difference between female and male employment rates 20–64, employment rate change (growth), and unemployment rate per age: classes of 5 years.

There are data from the censuses of 1991 and 2001.

Therefore we will be able to calculate the interval values for 1991 to 2011.

(2) GDP, income.

In Greece there are data for GDP only at NUTS-3 level.

There are published data for the declared income by households, businesses and public organisations at NUTS-3 level.

There are also published (on line) data on the declared average income by households before taxes (Greek Ministry of Economy and Finance) at LAU-1 level until the year 2003. It is possible to have these data for the subsequent years after request to the Ministry of Economy and Finance – see also in the section 3.2.6.

Also, it is possible, after request (see before), to have at LAU-1 level the values for the "average disposable annual household income" (after subtraction of taxes etc) and, further on, calculate, under conditions, the values of *"At persistent risk of poverty rate" indicator* (Population share with 60 % of the national equivalent median income).

[8] We should remark that almost all EU-27 countries are implementing a population census in 2001

Table 2.1: The list of the INTERCO headline indicators, availability of data for these indicators at LAU-1 level for Thessalia region

Thematic sub-category name	Indicator name	Data availability
		Thessalia at LAU-1 level
Population Structure*	Ageing index (persons 65+ / persons 0-14)	+
Population Structure*	Dependency rate	+
Population Structure*	Life expectancy at birth	
Total population	Population potential within 5 km	
Total population	Population average annual growth	+
Energy	Share of renewable energy in final energy consumption and increase needed to meet the 20% target	
Education	Population aged 30–34 with a tertiary education in 2008 and distance to Europe 2020 target	
Education	Share of tertiary educated people in %	+
Health	Healthy life expectancy (ESPON 3.2)	
Health	Self-perceived personal state of health in EU Member States (5th CR)	
Poverty	At persistent risk of poverty rate (Population share with 60 % of the national equivalent median income)	
Poverty	Share of population living in workless or low work intensity households (5th CR)	
Other social	Work-life balance in EU Member States (5th CR)	
Quality of life	Happiness Index	
Quality of life	Share of population reporting crime, violence or vandalism by degree of urbanisation (5th CR) -	
Employment, Unemployment	Difference between female and male employment rates, 20–64	+
Employment, Unemployment	Employment rate change (growth)	+*
Employment, Unemployment	Unemployment rate per age: classes of 5 years	+*
Employment, Unemployment	Development of unemployment rate (male, female, young, total, 99-04)	+*
Income and Consumption	GDP per inhabitant (capita) in PPS or Euros, per year	
Income and Consumption	GDP change per inhabitant (capita) in PPS or Euros	
Income and Consumption	Median disposable annual household income	+
Investments, Finances and Expenditures	Public sector debt relative to GDP	
Environment quality	NATURA 2000 area (Share of Natura 2000 area in %)	**
Natural assets	Consumption of water per capita	
Governance	Electoral participation	**
Governance	Voice and accountability	

* Years of censuses

** See in more detail in the text

However, the harmonisation of the respective values for all the case studies is difficult, because the definitions of the “declared income” per EU country are very probably different.

(3) Environment quality

Indicator: NATURA 2000 area (Share of Natura 2000 area in %)

There are .shp files for the boundaries of the NATURA 2000 regions. Therefore, it is possible to calculate the values of this indicator at LAU-1 level.

However, the harmonisation of the respective values for all the case studies is difficult, because the implementation of the definition of the “NATURA 2000 area” made by each EU country is probably different.

(4) Governance

Indicator: Electoral participation

There are such public data for Greece (and Thessalia) at LAU-1 level.

However, the harmonisation of the respective values for all the case studies is difficult, because the implementation of the definition of the “Electoral participation” made by each EU country is probably different.

For all other INTERCO headline indicators there are not available data at LAU-1 level for the Thessalia region.

Specific problems of availability and quality of data for Thessalia

During the last two decades, the National Statistical Service of Greece has made enough changes in the definitions of the indicators and spatial typologies which were used, a fact that has made the diachronical comparisons very difficult. Indicatively, while in most of the analyses of population before 2001, “de facto” population is used, since the 2001 (year of census) “resident population” is mainly used.

Furthermore the classification in urban / rural regions etc has changed.

Also, the published data for the 1991 and 2001 censuses has changed more than two times.

3. Analysis of TC on the basis of feasible headline indicators

In this section we will analyse TC in the “local scale” case of Thessalia on the basis of both NUTS-3 and LAU-1 data as a major objective of our research is exactly to see at **which extent the TC pattern of Thessalia at the (local) LAU-1 level differs from the respective pattern at (regional) NUTS-3 level.**

As we have mentioned previously, we can’t examine a great number of TC indicators at local level because the respective data are scarce. We will examine only nine headline indicators:

- Two indicators of “competitiveness”: unemployment rate and employment rate. In addition, we will comment the GDP at NUTS-3 level.

- Five indicators of “inclusion”: **share of tertiary educated people, ageing index** (people aged 65+ / total population), **population density, population growth and average households income**. In addition, we will comment the Life expectancy at NUTS-3 level.

Therefore, we will not give a complete analysis of TC at local level in Thessalia. We will only try **to see if the analyses at LAU-1 level bring important new insights regarding the TC patterns at NUTS-3 level as well as on the differences between these two last.**

In more detail, we will examine several types of statistics of variation at NUTS-3 and LAU-1 level: min / max, mean (average), standard deviation and coefficient of variation and we will evaluate at which extent these statistics reflect the inequalities regarding TC.

The analysis of the feasible indicators is oriented to study TC inequalities regarding some of the more important ESPON **territorial typologies** at NUTS-3 level (between urban and rural areas, mountainous and lowland areas, coastal areas, islands, industrial decline areas) in the case of Thessalia. We will also try to study TC inequalities at LAU level according analogue typologies for this level – see in the section 1.3. Finally, we will try to assess TC inequalities among other territorial types as for instance among “peripheral” and central areas.

3.1. Competitiveness

3.1.1. GDP

As we have already mentioned, in Greece there are GDP data only at NUTS-3 level. We will make an analysis at this level, taking in addition into account the type of each NUTS-3 unit according to an urban-rural typology and the presence of FUAs.

Regarding, specifically, GDP, we need examine its change in the frame of the evolution of the GDP in frame of the total of the country and the region of Thessalia[9].

GDP per capita in Greece in *1995* (12,300 - PPS / Purchasing Power Standard at current market prices) was equal to the 84.2% of the average in EU-27 (14,700). It rose up to 92.8% (23,100) of the respective average in *2007* (24,900). Therefore, *it gained 8.6 points –Table 3.1.1*[10]*.*

GDP per capita in Thessalia in 1995 (10,900) was at 74.2% of the average in EU-27 and at 88.6% of the average in Greece. It decreased to 68.2% (17,000) of the EU-27 average and to 73.6% of the Greek average in 2007. Therefore, *Thessalia GDP decreased considerably compared to Greece and EU*; it lost 15.0 points and 6.0 points, respectively.

The GDP PPS per capita **has decreased** from 1995 to 2007 (in terms of % rate of the EU and Greece averages) **less in the relatively more urban NUTS-3 regions than in the relatively more rural ones;** specifically, losses were smaller for Trikala -17.8 percentage points- a slightly less "rural" prefecture than Karditsa, which lost 25.9 percentage points (its GDP per capita decreased from 80.5% of the national average in 1995 to 54.5% in 2007). The losses were even smaller for Larisa (12.8 points) which has an important rural sector but also a big urban centre. The smallest decrease was presented in the case of Magnesia (only 9.7 points) which has a comparatively less important rural sector. Thus the higher decreases could be attributed to the higher decrease of GDP in the rural sector.

Table 3.1.1a: EU27, Greece, Thessalia: GDP PPS at current prices per capita 1995, 2001, 2007

		Purchasing Power Standard (PPS) per inhabitant			Purchasing Power Parities per inhabitant in percentage of the EU average				Purchasing Power Parities per inhabitant in percentage of Greece average			
Code		1995	2001	2007	1995	2001	2007	Differences in % points 1995-2007	1995	2001	2007	Differences in % points 1995-2007
	EU27	14,700	19,800	24,900	100.0	100.0	100.0					
GR	Greece	12,300	17,100	23,100	84.2	86.5	92.8	8.6	100.0	100.0	100.0	
GR14	Thessalia	10,900	13,300	17,000	74.2	67.0	68.2	-6.0	88.6	77.8	73.6	-15.0
GR141	Karditsa	9,900	10,200	12,600	67.8	51.4	50.5	-17.3	80.5	59.6	54.6	-25.9
GR142	Larisa	11,000	14,600	17,700	75.2	73.7	71.0	-4.2	89.4	85.4	76.6	-12.8
GR143	Magnesia	12,000	15,100	20,300	81.6	76.1	81.4	-0.2	97.6	88.3	87.9	-9.7
GR144	Trikala	9,800	10,400	14,300	67.1	52.7	57.3	-9.8	79.7	60.8	61.9	-17.8

[9] Some parts of the following paragraphs are compiled from the ESPON DEMIFER / Thessalia case study (2010)

[10] See for the GDP in Euros in the respective Table of ESPON DEMIFER (2010).

Source of data: EUROSTAT - elaboration of the Table: NTUA

Using the ESPON Database 2013 dataset for FUAs (see in Bibliography – Sources) for the GDP in the four FUAs of Thessalia –see in Table 3.1.2- we reach similar conclusions to those for the respective NUTS-3 regions.

We note that: (a) GDP per FUA (2006) refers to the share of the GDP of the NUTS-3 intersecting with the FUA (b) GDP of the FUA per capita (2006) corresponds to the GDP (of the FUA) divided by the population of the FUA.

Table 3.1.1b: FUAs of Thessalia: GDP (millions of Euros) and GDP per capita (Euros per capita) 2006

FUAs	NUTS-3 region	GDP - millions of Euros	GDP per capita - Euros per capita 2006
Larisa	Larisa	2,673	14,000
Trikala	Trikala	1,133	12,000
Volos	Magnesia	2,620	17,000
Karditsa	Karditsa	571	10,000

Source of data: ESPON Database 2013 dataset for FUAs

3.1.2. Unemployment

We examined the unemployment rate % (INTERCO headline indicator) for 2001.

Unemployment rate: Definition of the indicator by Eurostat

Regional (NUTS level 2) unemployment rate represents unemployed persons as a percentage of the economically active population (i.e. labour force or sum of employed and unemployed). The indicator is based on the EU Labour Force Survey. Unemployed persons comprise persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. currently available for work; 3. actively seeking work or who had found a job to start within a period of at most three months.

As we have mentioned, there are data for Thessalia for both the NUTS-3 and the LAU-1 levels –only for 2001 (census year) for the latter.

Regarding the long term evolution at national, regional (NUTS-2) and NUTS-3 levels, unemployment % rates (age: 15 years and over) decreased *in Greece and Thessalia* from 12.1% and 13.4%, respectively, in 1999 to *7.7% and 8.4% in 2008.* However, *the unemployment rates for Greece and Thessalia in 2008 were greater than that of the EU-27 (7.0%)* - Table 3.1.2.

Regarding the analysis at the Thessalia NUTS-3 level, the more important "territorial" result is that unemployment rates have decreased more from 1999 to 2008 in the rural prefectures of Karditsa and Trikala[11] than in the more urbanised prefectures of Larisa and Magnesia. in 2008 unemployment rates were higher in the more urbanised

[11] DEMIFER (2010)

prefectures of Larisa and Magnesia than in the rural prefectures of Karditsa and Trikala.

Table 3.1.2: Unemployment rate (population 15 years and over) - EU27, Greece, Thessalia % 1999-2008

		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
EU27						9.1	9.2	8.9	8.2	7.2	7.0
GR	Greece	12.1	11.4	10.8	10.3	9.7	10.5	9.8	8.9	8.3	7.7
GR14	Thessalia	13.4	12.9	12.9	11.4	10.7	9.8	9.5	8.2	7.8	8.4

Source of data: EUROSTAT - elaboration of the Table: NTUA team

We should note here that the definition of unemployment rate used for the following analysis for the census year 2001 at LAU and NUTS-3 level differs slightly from that of Eurostat.

Variations at NUTS-3 and LAU-1 levels, territorial typologies

The difference of the unemployment rates' variations **among the LAU-1 and the NUTS-3 level** were considerable in 2001, as it results from the Figure 3.1.2a; the max and min values for the unemployment rate differ considerably, while the respective means differ a few. Also the difference of the Coefficients of variation at LAU-1 and NUTS-3 level is pronounced.

Specifically, the rates of the four NUTS-3 regions range between 9,5% for the relatively more urbanized NUTS-3 of Larisa and 13,3% for the more rural NUTS-3 of Karditsa. The rate for Magnesia (more urban) amounted in 11,8% and the one for Trikala (more rural) in 9,9%.

This analysis of unemployment rate disparities contrasts to a larger variation between the 104 LAU units that range between 1,6% and 22,2%. So the analysis at lower level can reveal that there are 20 municipalities with unemployment rates higher than 13,3 and 45 municipalities with rates below 9,5.

The LAUs with the higher rates (above the average rate of Thessalia) are located in the NUTS-3 of Karditsa[12], which has also the highest rate in Thessalia. But there are also LAUs in the top 10 of high unemployment in other NUTS-3 regions as for example the LAUs of Aspropotamos (21,1%) in Trikala and Almyros (15,9%) in Magnesia. This wouldn't be evident without an analysis at LAU level.

See for the unemployment rate % in 2001 in Thessalia measured across LAUs within the NUTS-3 regions and the respective coefficients of variation in *Figure 3.1.2b.*

[12] With highest rates in Rentina (22,2) and Mouzaki (16,4).

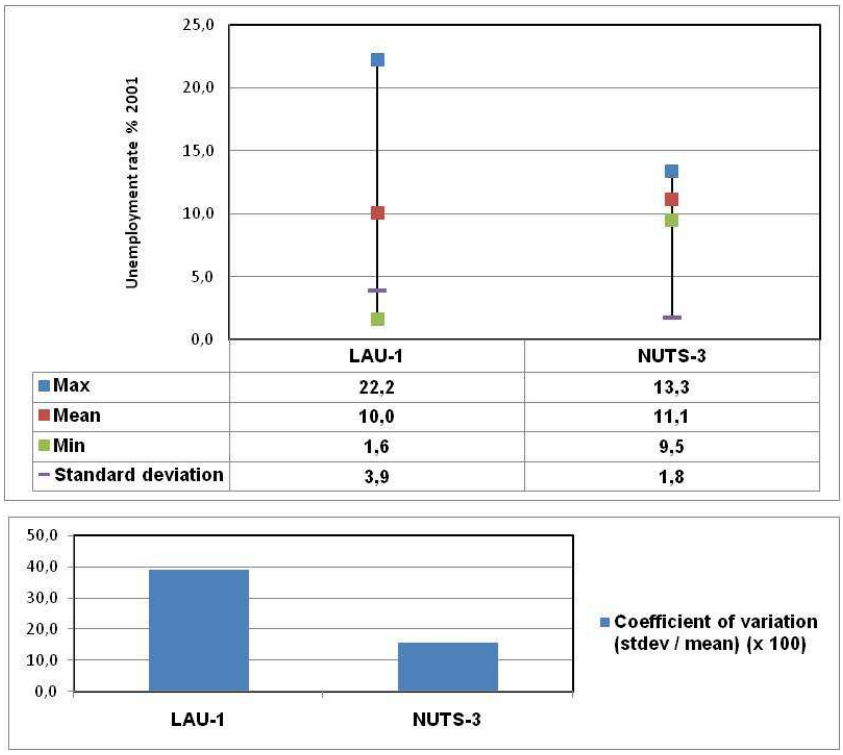


Figure 3.1.2a: Unemployment rate % in 2001 in Thessalia at NUTS-3 and LAU-1 levels: max, min, mean, standard deviation and Coefficient of variation

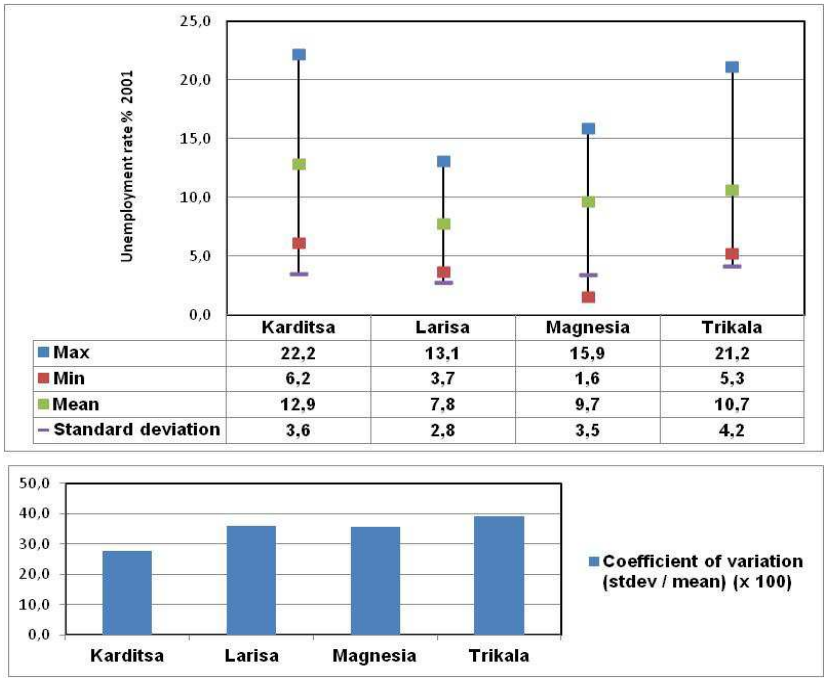
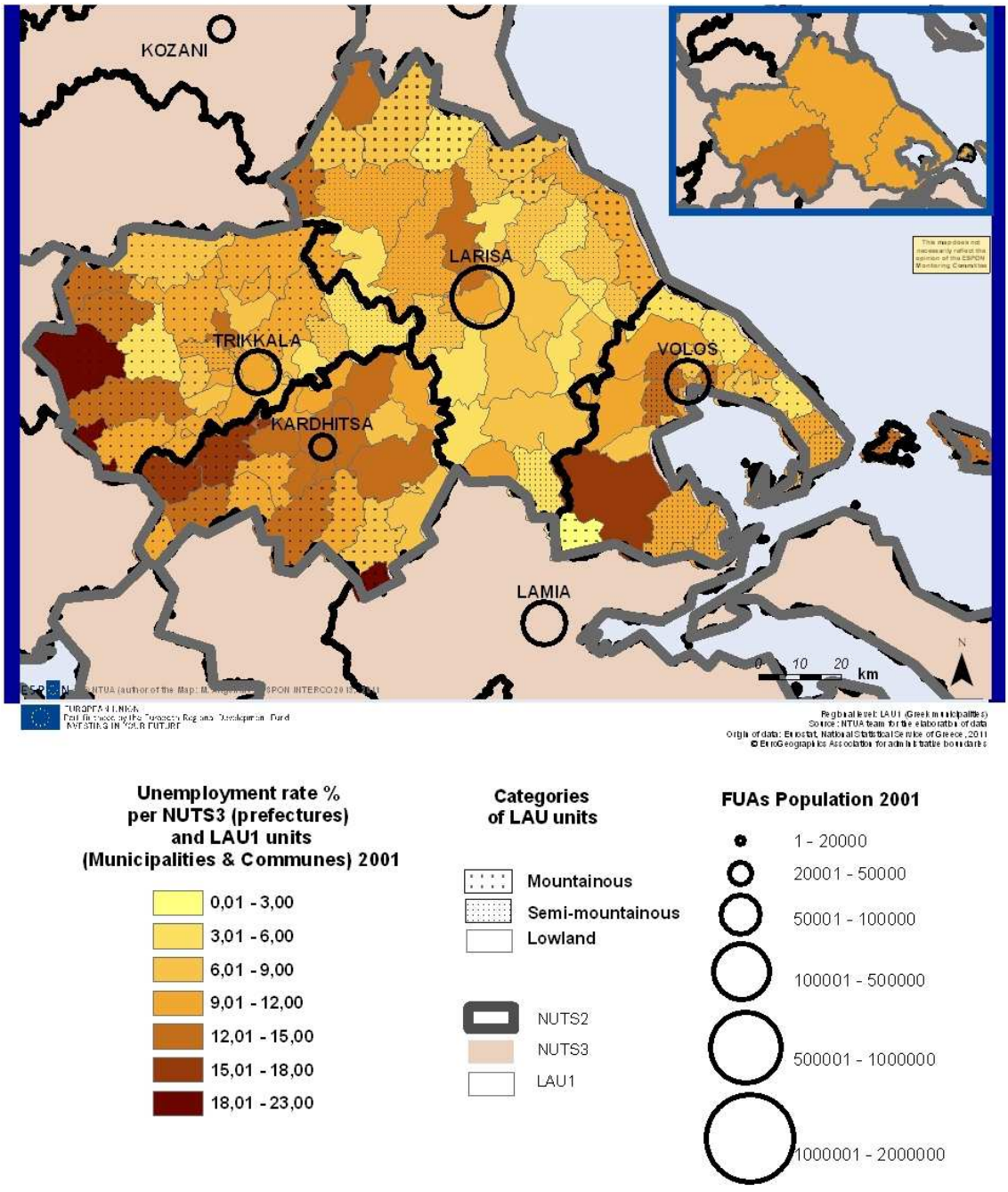


Figure 3.1.2b: Unemployment rate % in 2001 in Thessalia measured across LAUs within the NUTS-3 regions and coefficients of variation

The analysis at LAU level **on the basis of the mountainous typology and the urban-rural one** has revealed that the mountainous LAUs of Thessalia present in most cases higher unemployment rates than lowland LAUs –see the Map 3.1.2 (and also the Map 1.2.1). Also it can be seen that high unemployment rates are not only found in

peripheral areas but local examples of high unemployment are also found in LAUs including cities, like Karditsa (rate 13,8 and population over 40.000 inh.), or close to big cities like Nea Ionia (rate 14,90 and population over 30.000 inh.).

Therefore, *the disparities among the urban and rural as well as among the mountainous and the lowland areas of the region are much more clearly presented through the LAU level analysis.*

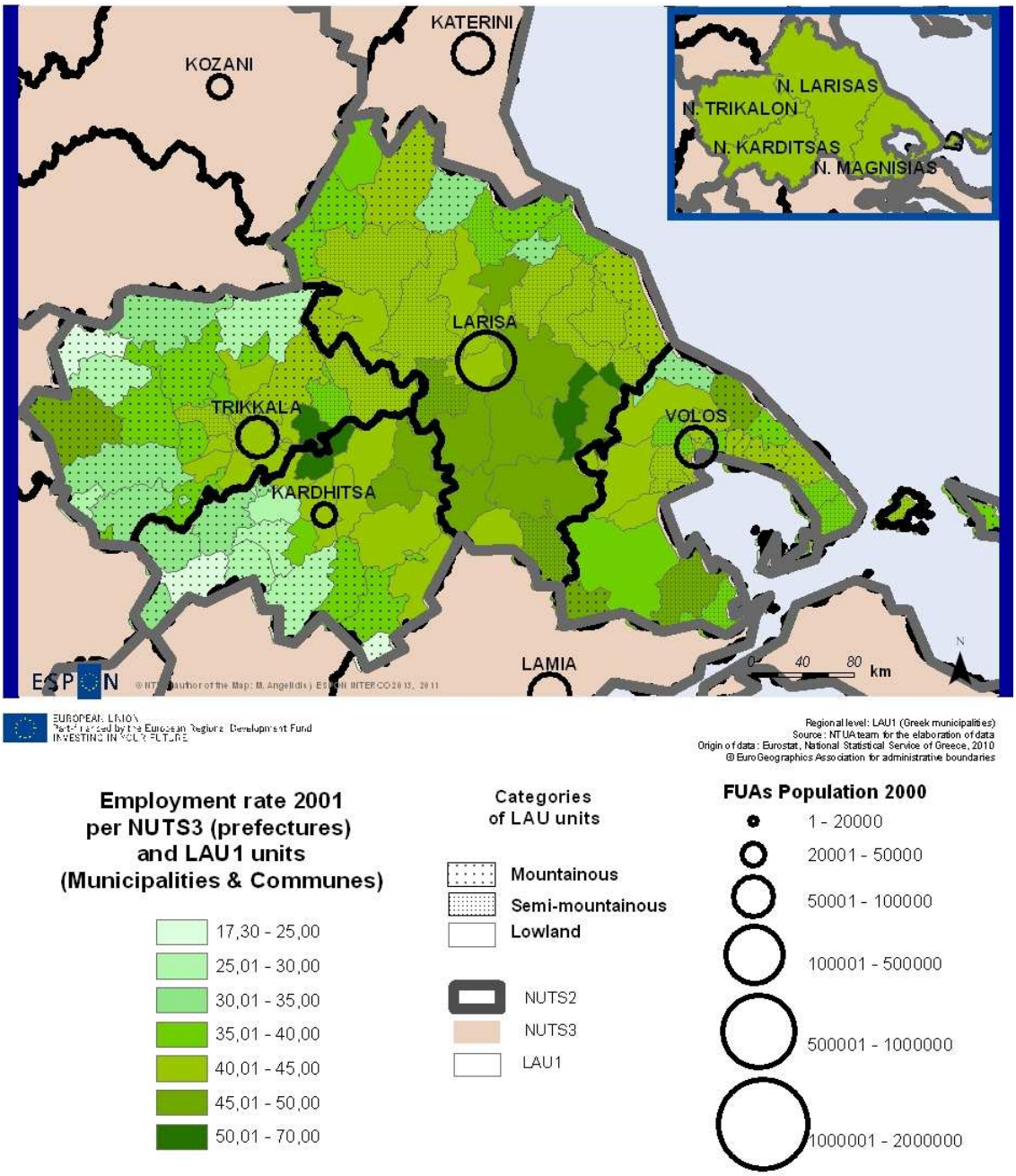


Map 3.1.2: Thessalia: Unemployment rate % 2001 per NUTS3 (prefectures) and LAU-1 (municipalities and communes) mountainous, semi-mountainous and lowland

Source of data: Eurostat and NSO of Greece, author: M. Angelidis

3.1.3. Employment

We examined the employment rate % (INTERCO headline indicator) for 2001.
As it results from the *Map 3.1.3*, the disparities on employment rate among the urban and rural areas of the region are very clearly presented through the LAU-1 level analysis.



Map 3.1.3: Thessalia: Employment rate % 2001 per NUTS3 (prefectures) and LAU-1 (municipalities and communes) mountainous, semi-mountainous and lowland

Source of data: Eurostat and NSO of Greece, author: M. Angelidis

Disparities among mountainous / lowland areas are clear in this case, however with some exceptions; for example, the high development of tourism in the eastern coastal area of Thessalia (Mount Pelion) which is mountainous explains to a considerable degree the higher level of employment in comparison with the other mountainous parts of Thessalia.

We will further analyse the variation of this indicator at NUTS-3 and LAU level for the INTERCO Final Report.

3.2. Inclusion

3.2.1. Population with tertiary education

Regarding the indicator "share of tertiary education %", we used in the case of Thessalia for 2001 (census year), both at NUTS-3 and LAU-1 levels, aggregations of the data for: holders of doctorate, holders of Master, graduates of University level institutions, graduates of Technological Educational Institutes

Variations at NUTS-3 and LAU-1 levels, territorial typologies

Also for this indicator, the difference of the Coefficients of variation at LAU-1 and NUTS-3 level is pronounced – *see in the Figures 3.2.1a and 3.2.1b and the Map 3.2.1.*

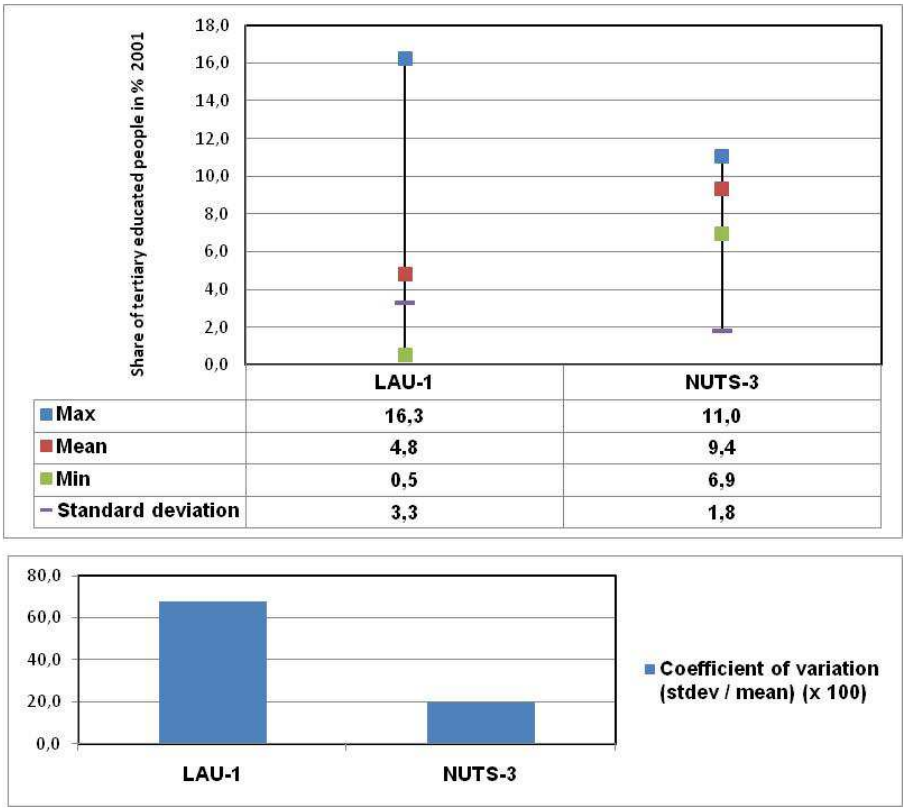
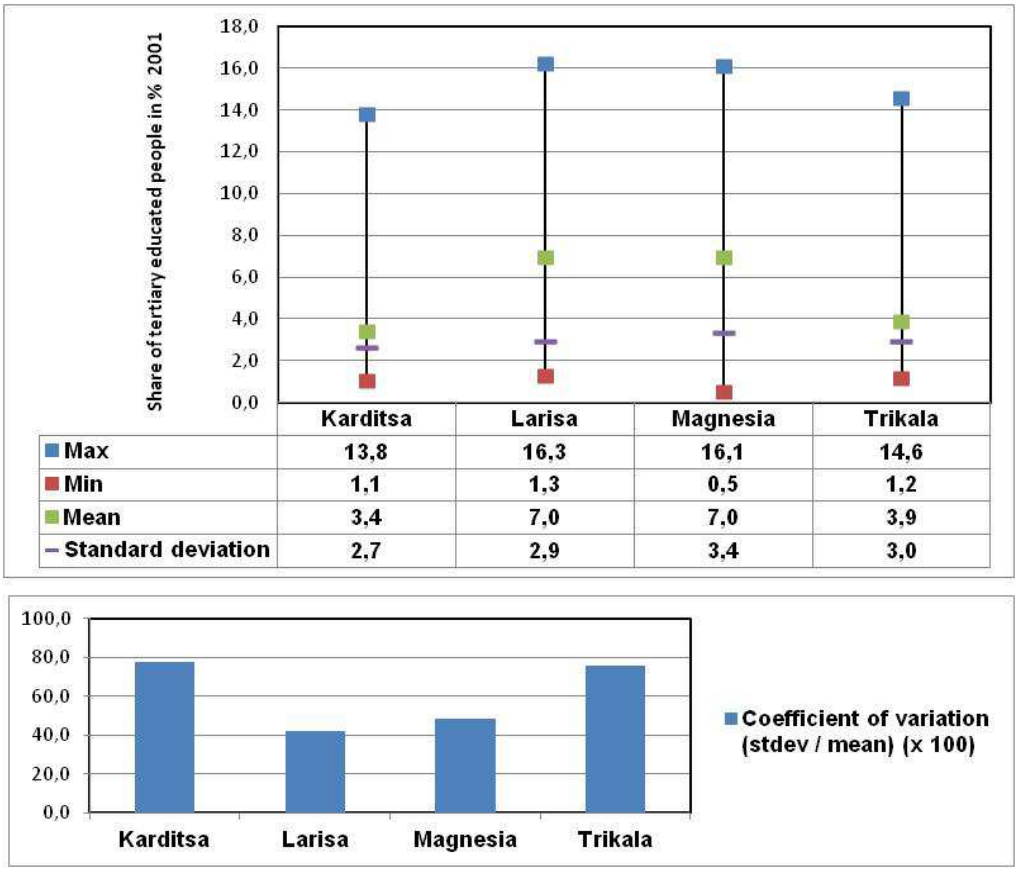


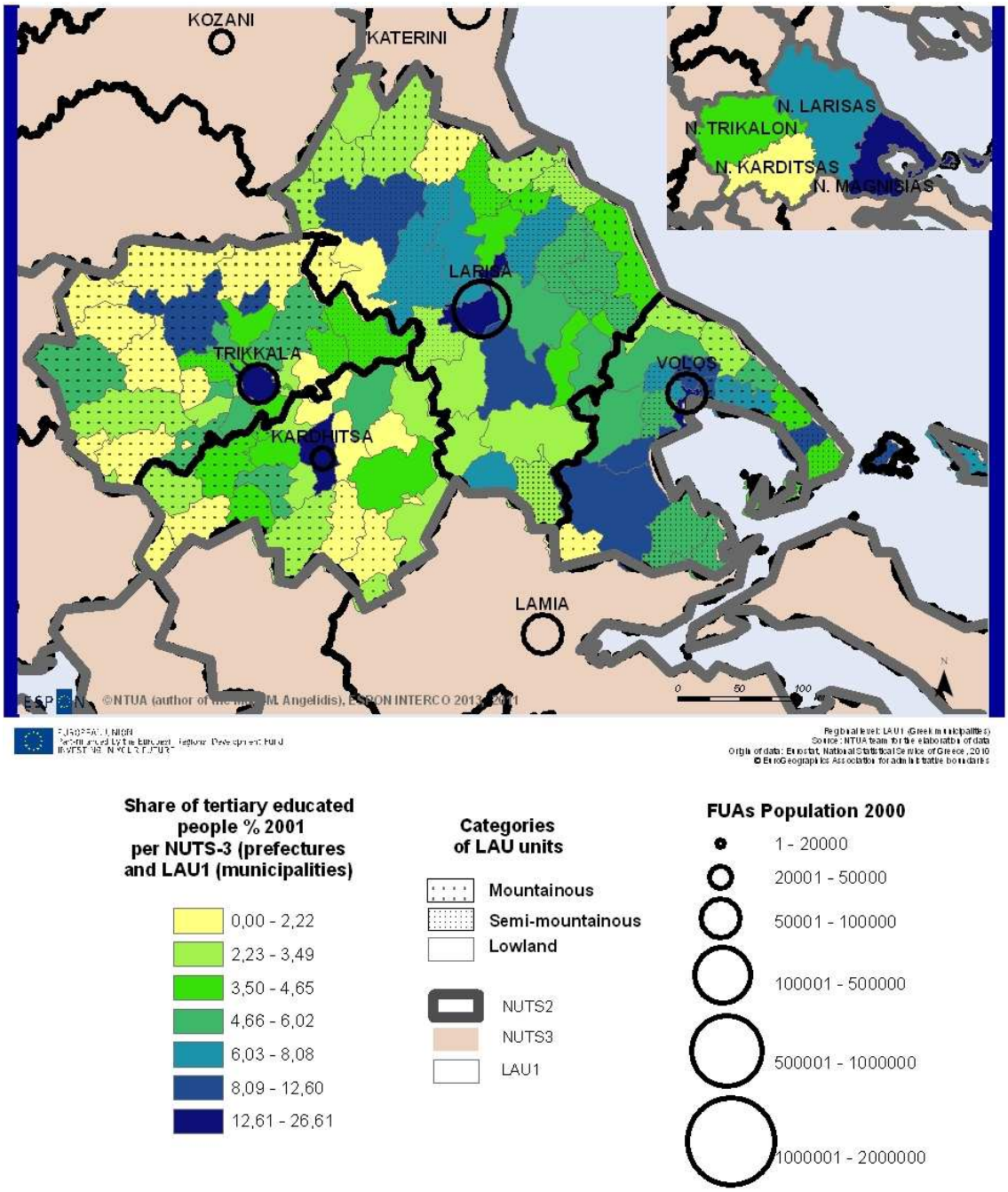
Figure 3.2.1a: Share of tertiary educated people % (2001) in Thessalia at NUTS-3 and LAU-1 levels: max, min, mean, standard deviation and Coefficient of variation

The disparities as for the tertiary education % among the urban and rural and the mountainous / lowland areas of the region are much more clearly presented through the LAU-1 level analysis.



	Karditsa	Larisa	Magnesia	Trikala
Max	13,8	16,3	16,1	14,6
Min	1,1	1,3	0,5	1,2
Mean	3,4	7,0	7,0	3,9
Standard deviation	2,7	2,9	3,4	3,0

Figure 3.2.1b: Share of tertiary educated people (2001) measured across LAUs within the NUTS-3 regions and coefficients of variation



Map 3.2.1: Thessalia region: Share of tertiary educated people % 2001 in NUTS-3 (prefectures) and LAU-1 (municipalities): mountainous, semi-mountainous, lowland, Functional Urban Areas (FUAs) population 2001

3.2.2. Population ageing

The analysis at national, regional (Thessalia) and NUTS-3 level shows that the population of Thessalia was in 2001 more aged than the country population. Populations of the more rural NUTS-3 units of Karditsa and Trikala were clearly more aged than the ones of the more urban NUTS-3 units of Larisa and Magnesia – see in Table 3.2.2.

Table 3.2.2: Population by age groups, NUTS3 regions of Thessalia 2001

Code	Regions	Total Pop. 2001	Pop. age: 0-14 years	Pop. age: 15-64 years	Pop. age: 65 or over	% Share of the pop. that is aged 15-64 years	% Share of the pop. that is aged 65 or over
GR	Greece	10,934,097	1,660,899	7,445,964	1,827,234	68.1	16.7
GR14	**Thessalia**	740,115	116,686	487,401	136,028	65.9	18.4
GR141	Karditsa	120,265	18,216	75,210	26,839	62.5	22.3
GR142	Larisa	282,156	45,965	189,666	46,525	**67.2**	**16.5**
GR143	Magnesia	205,005	32,033	137,783	35,189	**67.2**	**17.2**
GR144	Trikala	132,689	20,472	84,742	27,475	63.9	20.7

Source of Table: DEMIFER 2010. Source of data: Eurostat and NSS of Greece, our own elaboration

Variations at NUTS-3 and LAU-1 levels, territorial typologies

According to the *Figure 3.2.2a,* the minimum and maximum and also the average percentage of people 65+ years/ total population differ significantly, subject to the level of measurement (NUTS-3, LAU-1).

Also the difference of the Coefficients of variation at LAU-1 and NUTS-3 level is pronounced.

As it results from the Map 3.2.2 (see also the Map 1.2.1), the disparities among the urban and rural and the mountainous / lowland areas of the region are clearly presented through the LAU-1 level analysis.

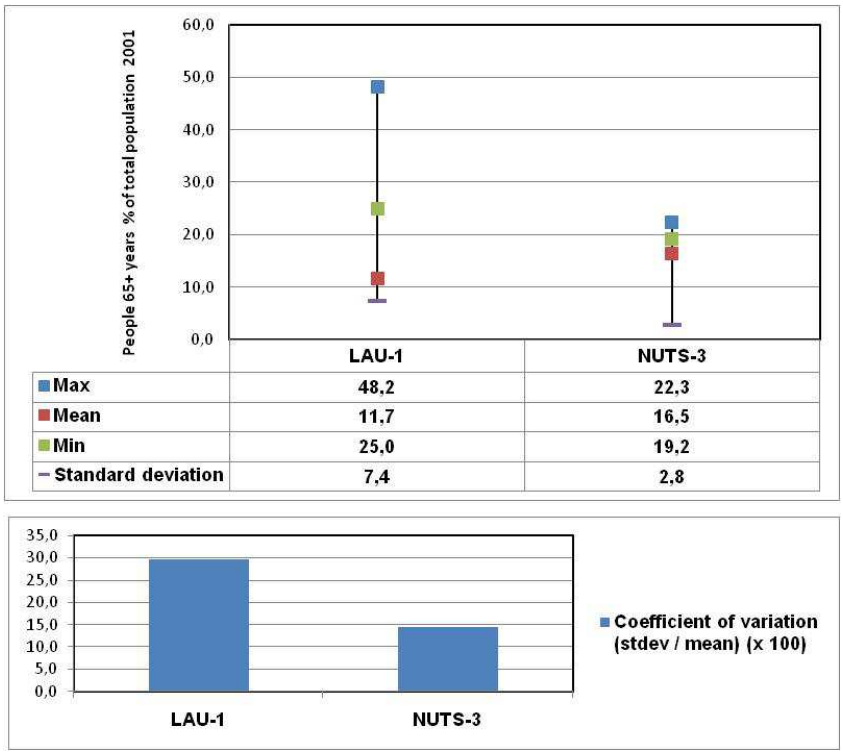


Figure 3.2.2a: People 65+ years % of total population 2001 in Thessalia at NUTS-3 and LAU-1 levels: max, min, mean, standard deviation and Coefficient of variation

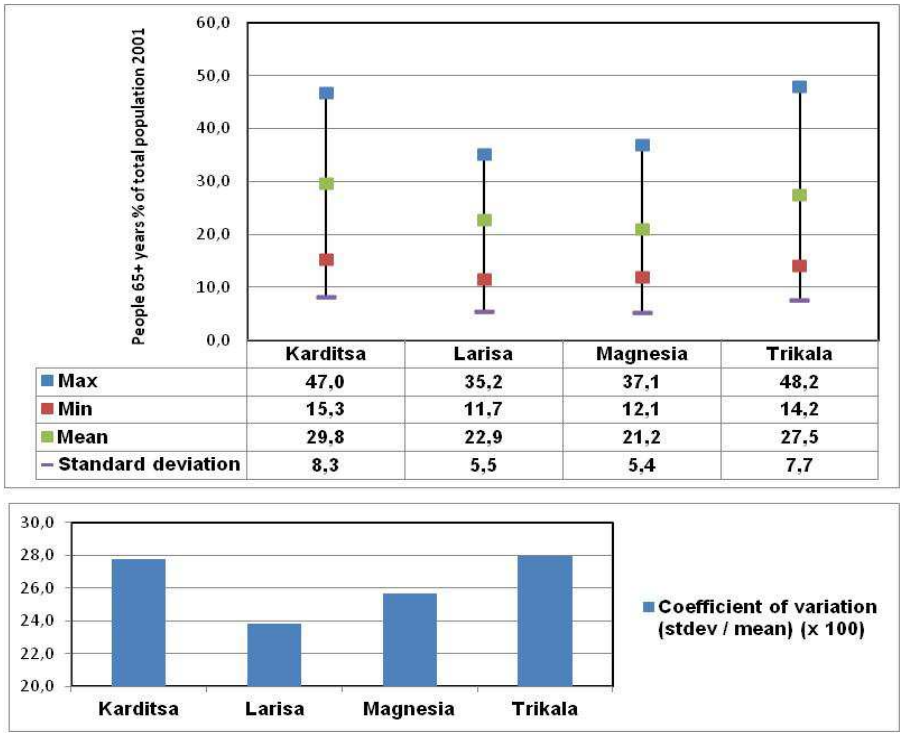
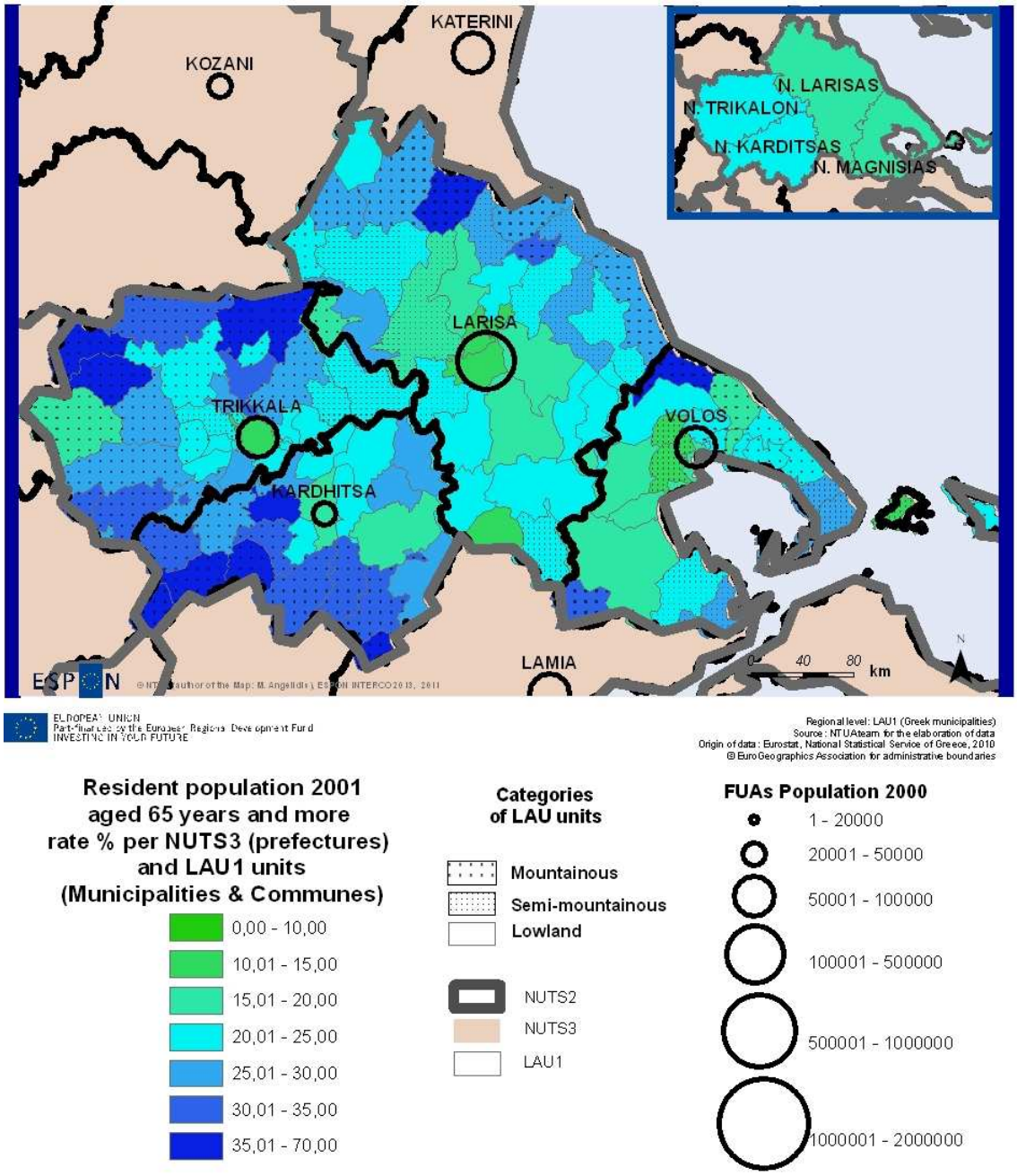


Figure 3.2.2b: People 65+ years % of total population (2001) in Thessalia measured across LAUs within the regions and coefficients of variation



Map 3.2.2: Thessalia: Ageing rate % (persons aged 65+ years / Total population) per NUTS3 (prefectures) and LAU1 (municipalities) 2001

Source of data: Eurostat and GSA, author: M. Angelidis

3.2.3. Life expectancy

As we have mentioned, there are data for Thessalia on Life expectancy by sex only for the NUTS-2 level.

Life expectancy at birth for men was higher in Greece than in EU-27 in 2002 as well as in 2007 - see in the Table 3.2.3. In contrast, while life expectancy at birth for women was higher in Greece than in EU-27 in 2002, it became comparatively lower in 2007.

In general terms, life expectancy in Thessalia both for less than 1 year and at 65 years has grown from 1999 to 2008 faster for men than for women. In 2008, life expectancy for women in Thessalia was clearly higher than for men.

Table 3.2.3: Life expectancy 1997-2008: EU-27, Greece, Thessalia by sex

		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	Life expectancy at birth (only), by gender												
Males	EU27						74.5	74.6	75.2	75.4	75.8	**76.1**	
	Greece	75.4	75.4	75.5	75.5	76.0	76.2	76.5	76.6	76.8	77.2	**77.1**	77.7
Females	EU27						80.9	80.8	81.5	81.5	82.0	**82.2**	
	Greece	80.4	80.3	80.4	80.6	81.0	81.1	81.2	81.3	81.6	81.9	**81.8**	82.4
	Life expectancy, by gender												
Thessalia Total	Less than 1 year	**77.4**	**77.6**	**77.8**	**77.9**	**78.3**	**78.3**	**78.7**	**78.5**	**79.2**	**79.7**	**79.2**	**79.8**
	65 years	17.2	17.2	17.2	17.3	17.4	17.3	17.8	17.6	18.3	18.5	**18.1**	18.5
	85 years and over	5.0	4.7	4.9	4.6	4.6	4.4	4.5	4.3	4.8	4.9	**4.7**	4.8
Thessalia Females	Less than 1 year	**80.2**	**80.3**	**80.4**	**80.5**	**80.7**	**80.9**	**81.2**	**81.1**	**81.9**	**82.3**	**81.9**	**82.4**
	65 years	18.2	18.2	18.3	18.3	18.4	18.2	18.8	18.5	19.2	19.5	**19.0**	19.4
	85 years and over	5.0	4.7	5.0	4.6	4.6	4.2	4.4	3.9	4.5	4.6	**4.1**	4.3
Thessalia Males	Less than 1 year	**74.7**	**75.1**	**75.3**	**75.5**	**76.0**	**75.8**	**76.3**	**76.1**	**76.7**	**77.3**	**76.7**	**77.3**
	65 years	16.1	16.1	15.9	16.1	16.3	16.3	16.7	16.7	17.3	17.5	**17.2**	17.5
	85 years and over	5.0	4.6	4.7	4.5	4.4	4.6	4.7	5.0	5.4	5.2	**5.6**	5.6

Source of the Table: DEMIFER 2010. Source of data: Eurostat - own further elaboration of data

3.2.4. Population density

Population density: Definition of the indicator by Eurostat
Population density is the ratio between (total) population and surface (land) area

Variations at NUTS-3 and LAU-1 levels, territorial typologies

The minimum and maximum and also the average population density differ significantly, at LAU1 level compared to NUTS3 level, indicating at LAU-1 that there are both areas which have very low population density and dense urban areas – *Figure 3.2.4a.* Also the difference of the Coefficients of variation at LAU-1 and NUTS-3 level is very big.

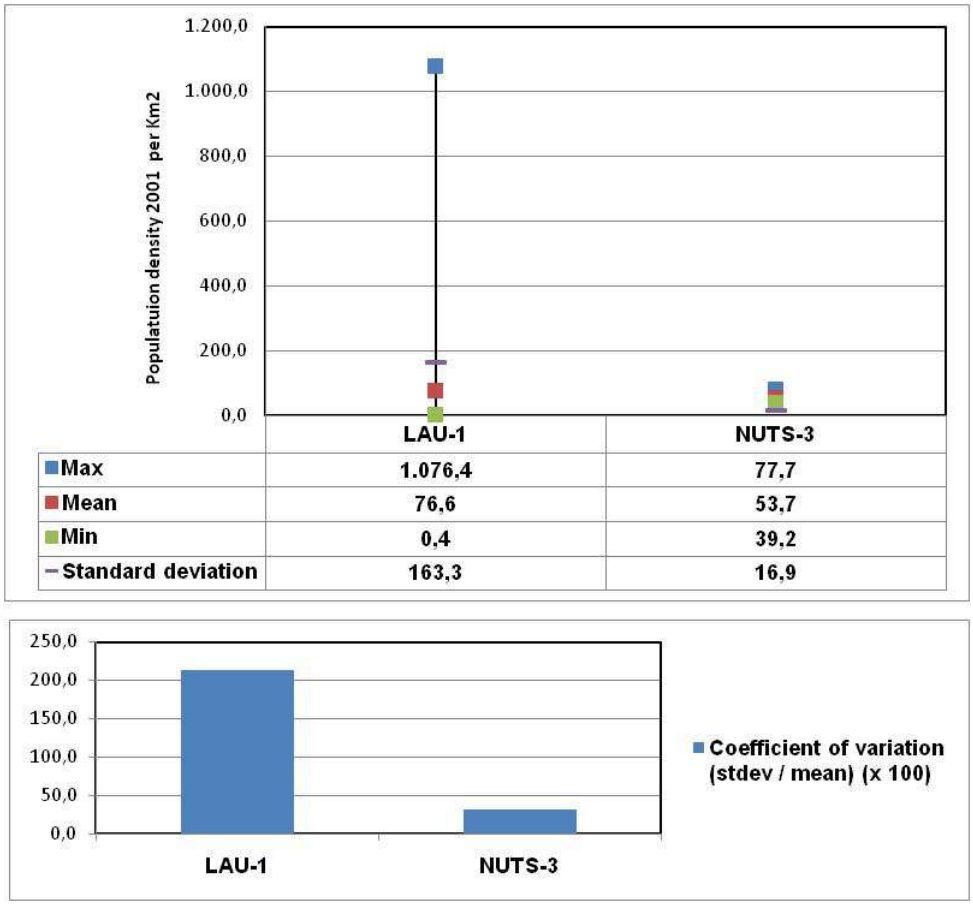


Figure 3.2.4a: Population density 2001 per Km2 in Thessalia at NUTS-3 and LAU-1 levels: max, min, mean, standard deviation and Coefficient of variation

Specifically, the range between the four NUTS 3 regions extend between 39 (inh./Km2) and 77 which contrasts to a much larger variation between the 104 LAU units that extend between 1 and 1076.

See for the population density 2001 in Piedmont measured across LAUs within the NUTS-3 regions and the respective coefficients of variation in *Figure 3.2.4b.*

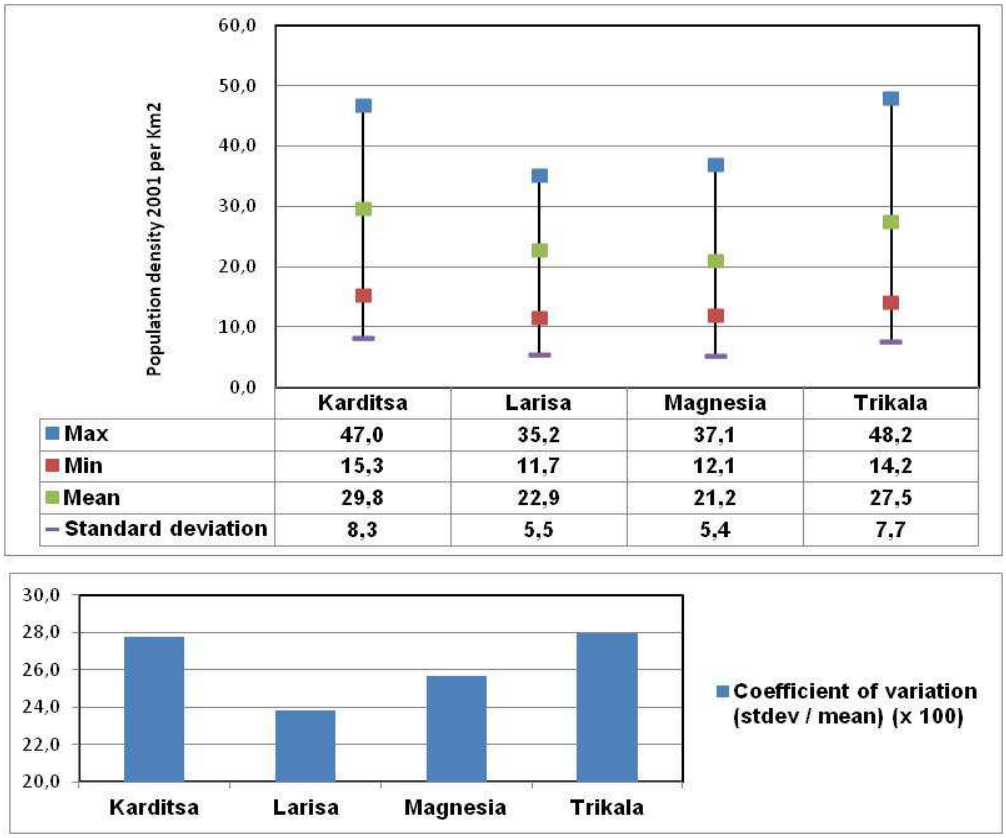
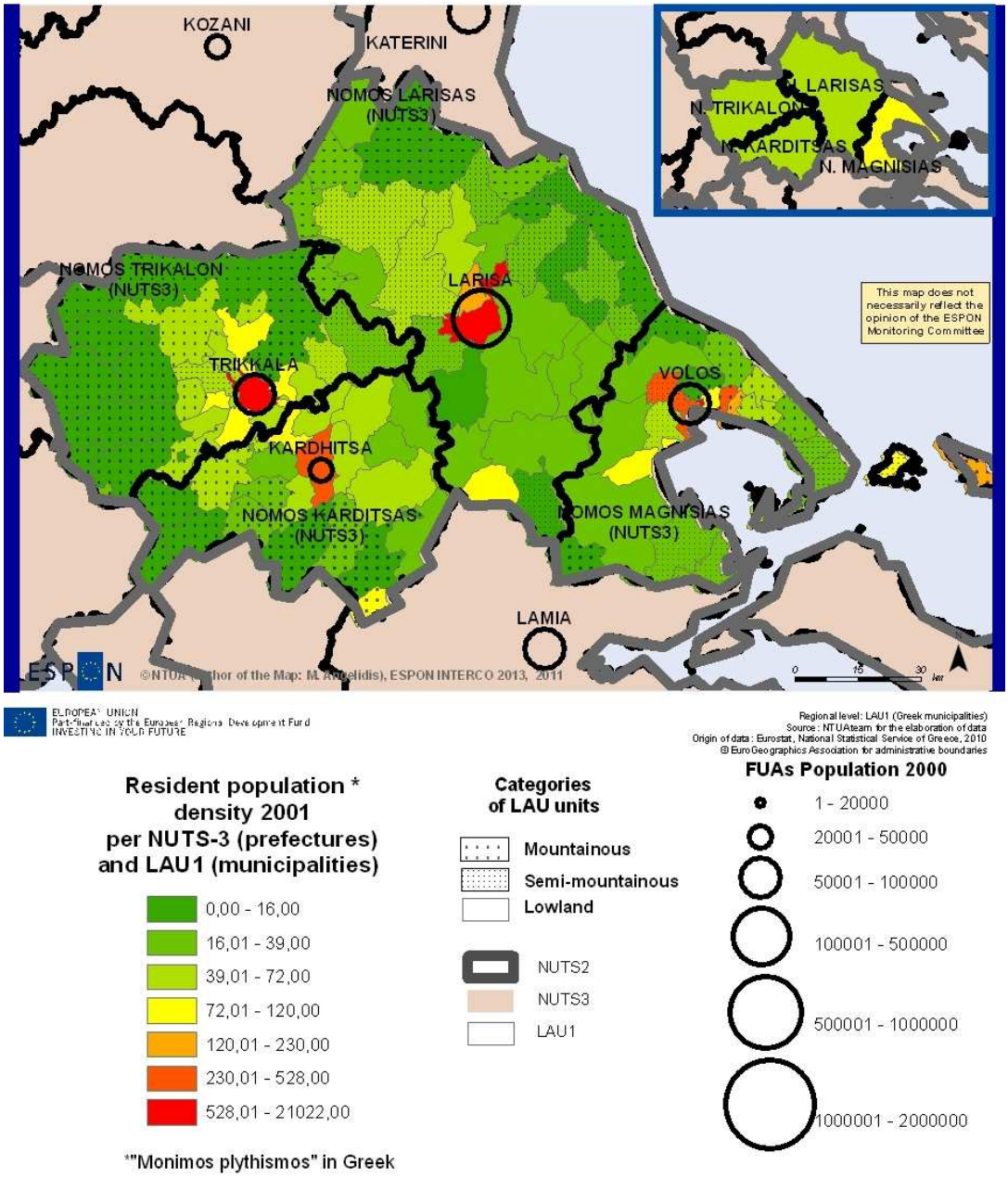


Figure 3.2.4b: Population density per Km2 (2001) in Thessalia measured across LAUs within the regions and coefficients of variation

As it results from the *Map 3.2.4* (see also the Map 1.2.1), the disparities among the urban and rural as well as among the mountainous and the lowland areas of the region are much more clearly presented through the LAU-1 level analysis.
In general terms, the mountainous LAUs present clearly lower population density then the lowland ones. Also, the coastal areas of Magnesia present relatively high population densities.



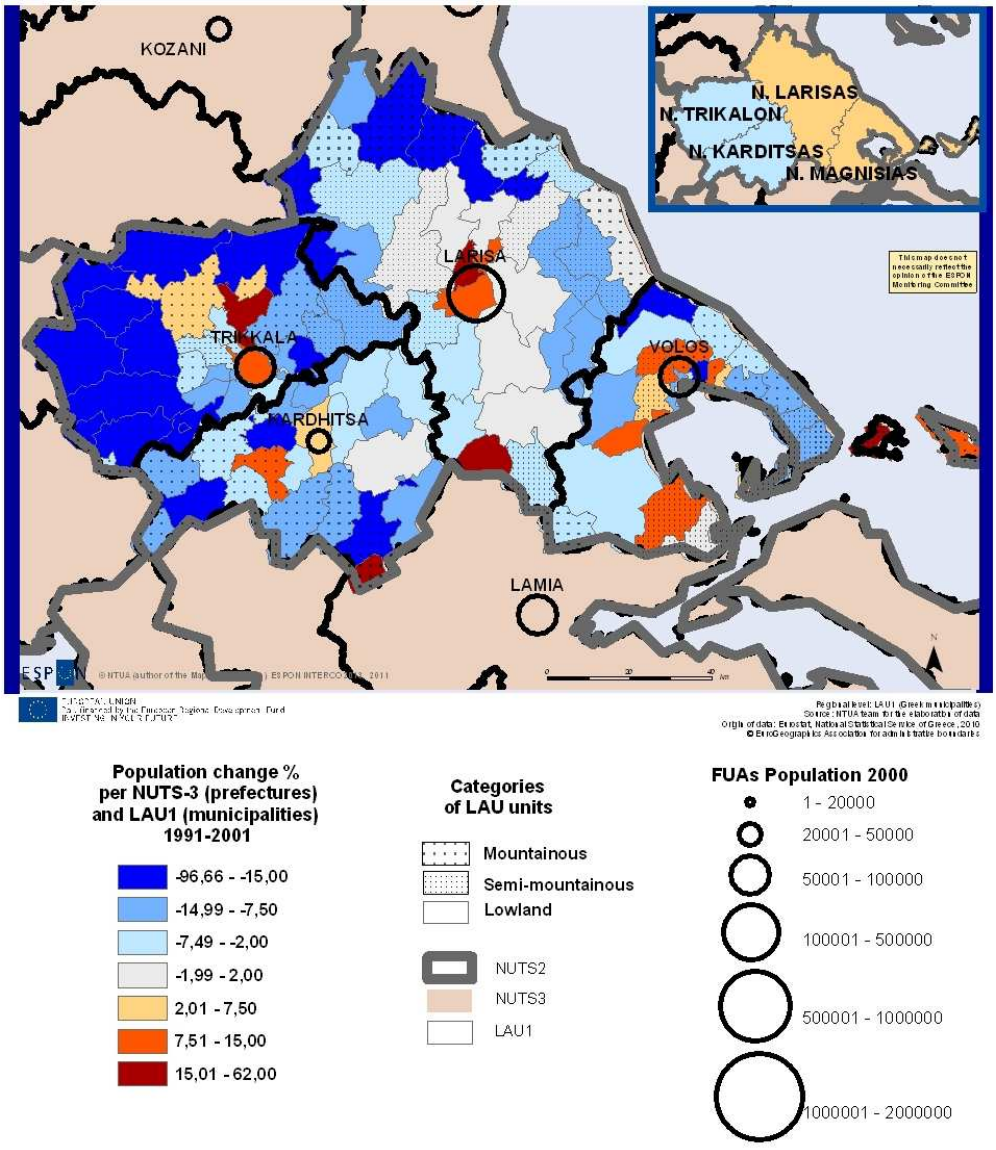
Map 3.2.4: Thessalia region: NUTS-3 (prefectures) and LAU1 population density 2001, Functional Urban Areas (FUAs) population 2001

Source of data: Eurostat and NSO of Greece

The LAUs with the higher densities are Larisa (1076) and Trikala (830) which are not located in the NUT-3 region with the highest density (Magnesia); the lowest densities are found in Aspropotamos (1) and Athamanes (3) which are characterized also by high unemployment rates. These substantial differences wouldn't be evident without an analysis on LAU level.

3.2.5. Population growth

As it results from the *Map 3.2.5* (see also the Map 1.2.1), the disparities on population change among the urban and rural and the mountainous / lowland areas of the region are very clearly presented through the LAU-1 level analysis.



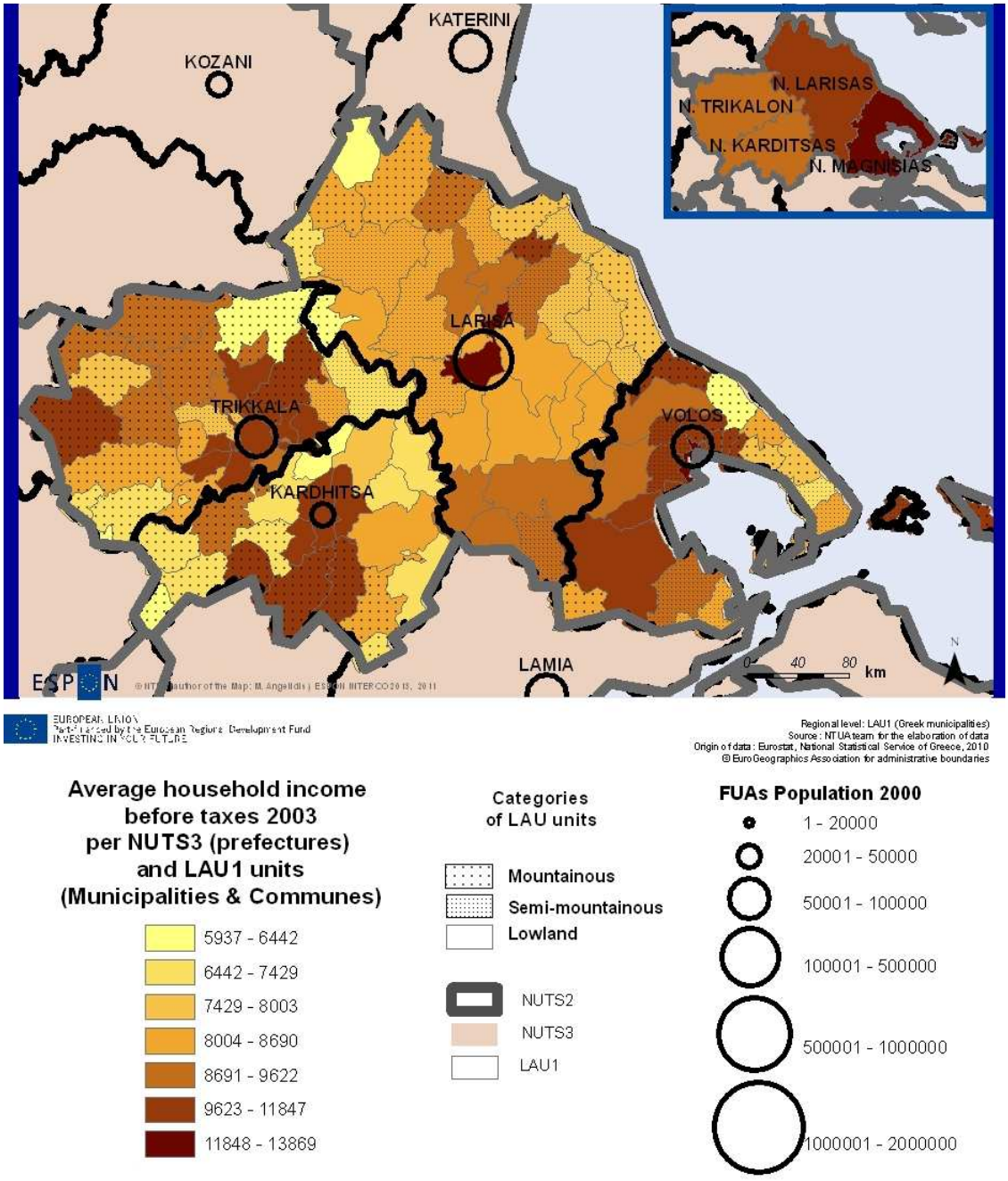
Map 3.2.5: Thessalia region: Population change % 1991-2001 per NUTS-3 (prefectures) and LAU1 (municipalities): mountainous, semi-mountainous, lowland

Source of data: Eurostat and NSO of Greece, author: M. Angelidis

3.2.6. Income

Households' income is a crucial parameter of the inclusion dimension of TC.

We have used data on the average income (in Euros) declared by households before taxes) for the year 2003 at NUTS-3 and LAU-1 level of Thessalia. The data are provided by the Greek ministry of Economy. The Ministry provides data online at postcode level for the years 2000 to 2003. It is possible to acquire data for the years 2004-2009 after specific request.



Map 3.2.6: Thessalia region: Average household income before taxes in Euros in NUTS-3 (prefectures) and LAU1 (municipalities): mountainous, semi-mountainous, lowland

As it results from the *Map 3.2.6*, the disparities on average household income among the urban and rural areas of the region are very clearly presented through the LAU-1 level analysis. Disparities among mountainous / lowland areas are not so clear in this case for different reasons; for example, the high development of tourism in the eastern coastal area of Thessalia (Mount Pelion) which is mountainous explains to a considerable degree the higher level of income in comparison with the other mountainous parts of Thessalia.

We will further analyse the variation of this indicator at NUTS-3 and LAU level for the INTERCO Final Report.

4. Geographical specific indicators in the case study: searching for "native" indicators

In the section 2 we have presented the indicators for which there are available data for the case of Thessalia at LAU level. This refers to data published by GSA –which can be found in Greek online directly or online in .pdf format.

However, it is possible to have data for other indicators, for instance migration, using a procedure of specific request to the GSA. These data correspond to the censuses of 1991 and 2001.

Also, as we have stressed in section 2, it is possible to have at LAU-1 level the values for the following indicators: median disposable annual household income, at persistent risk of poverty rate, electoral participation and NATURA 2000 area (Share of Natura 2000 area in %), but the harmonisation of the respective values with LAUs of other ESPON countries is difficult, because the implementation of the definitions of these indicators made by each ESPON country is probably different.

Finally, it should be stressed that datasets useful to measure crucial National and EU concepts at a local (LAU) level in Thessalia regarding for instance business development or tourism activities are provided and regularly updated by NUTS-3 level Chambers.

5. Key findings and conclusions

The case study area of Thessalia (Greece) is a NUTS-2 region and corresponds to four NUTS-3 units. It includes two relatively large cities: Larissa and Volos, and two medium sized cities: Trikala and Karditsa. Volos is centre of an Intermediate region, close to a city while the three other cities are centres of predominantly rural areas, according to the ESPON urban-rural typology.

While a large part of Thessalia is lowland, there are important in extent mountainous areas as well as coastal areas and islands.

The primary sector of the region while declining continue to be important at national level; the formerly considerably developed industry of the two bigger urban centres has strongly declined during the last thirty years, while the development of services and construction has partly compensated the losses of jobs in the region. Tourism continues to develop in the coastal area and even more in the islands of the region.

All these trends are typical for the Greek regions and to a considerable extent to the southern regions of the ESPON space.

The analysis, using several types of statistics of variation (min / max, mean (average), standard deviation and coefficient of variation) at LAU level (municipalities in this case) has shown larger gaps between LAU units than NUTS-3 regions as all the ranges of results at LAU level for all of the feasible TC indicators used (unemployment rate, employment rate, rate of the tertiary educated people, population growth and ageing, population density and income) were larger than the ones registered by NUTS-3 figures. The coefficients of variation (which is the more appropriate statistic for this issue) are clearly higher at local level, implying therefore a broader level of complexity of the indicators at this level.

The analysis at LAU level displays important disparities in respect of all the ESPON **territorial typologies** (applying to the region) and all the indicators used. **Rural** LAU population decreases strongly while the **urban** LAU one is stable or increase; the ageing and unemployment rates of the first are clearly higher and rise faster; its rate of tertiary educated people is clearly lower. Similar disparities are revealed when comparing the **mountainous** to the lowland population. It seems that the population of the **coastal** areas' and **islands**' LAUs –which are partly mountainous and rural- performs better than that of the respective comparable LAUs. Finally, the more intense **industrial decline** of the city of Volos explains to some extent its lower performance regarding population growth and structure.

Figures at local level were also able to illustrate strong **disparities inside single NUTS-3 regions** depending on its settlement structure. For instance, the economy of the western part of the NUTS-3 region of Trikala collapses because it is mountainous but also because it lacks small cities and the centre of the NUTS-3 region is relatively week.

The analysis at a local level also allowed us to identify that local areas which performs weaker as for some important dimensions of Territorial Cohesion are not exclusively

restricted to peripheral or rural sparsely populated areas but on the contrary are also found around major urban centres: for instance LAUs with very high unemployment rates are found in the immediate neighbouring areas of Larissa and Volos; the unemployment rate of these LAUs surpasses the respective rates for the mountainous and very sparsely populated LAUs of Thessalia. It was also found that average regional figures are unable to show exceptional local situations.

It should also be stressed that datasets useful to measure crucial National and EU concepts at a local (LAU) level in Thessalia regarding for instance business development or tourism activities are provided and regularly updated by NUTS-3 level Chambers.

Regarding specifically the **data availability and quality for the INTERCO headline indicators at local (LAU) level**, the results for the case of Thessalia was in general terms satisfactory. There are data at LAU level for Thessalia for a considerable number of INTERCO headline indicators (13 out of 27). However, for four indicators (income and poverty, NATURA 2000 and electoral participation), the harmonisation of the respective values for all the case studies is very difficult, because the implementation of the definitions of the respective indicators made by each EU country are probably very different. To a smaller extent, this is the case even for indicators such as unemployment and employment where the definitions used for the elaboration and publication of the national censuses data at LAU (local) level until the 2001 census round differ slightly from those used by Eurostat. Therefore, as a respective policy recommendation, Eurostat should emphasise on the harmonisation of the definitions used for the “local” INTERCO headline TC indicators that we have mentioned, with emphasis in the national census rounds.

As a general conclusion, the study of the Thessalia case has demonstrated that “really territorial” aspects of cohesion could not be appropriately analysed using indicators at NUTS-3 level. The use of local indicators at LAU level could be very useful by complementing the latter analyses.

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ESPON

INTERCO
Indicators of territorial cohesion

Scientific Platform and Tools Project 2013/3/2

Annex 8

TERRITORIAL COHESION INDICATORS FOR WESTERN BALKANS AND TURKEY

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EUROPEAN UNION
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Abbreviations

GDP: Gross Domestic Product
NUTS: Nomenclature of Territorial Units for Statistics

Countries
CC: Candidate Countries
PCC: Potential Candidate Countries
WB: Western Balkans

EU-27: 27 Member States of the European Union

AL: Albania, BA / FBiH: Federation of Bosnia and Herzegovina, HR Croatia,
ME: Montenegro, MK: FYROM / the Former Yugoslav Republic of Macedonia,
RS: Serbia, TR: Turkey, XK: Kosovo under UNSCR 1244/99

See for the abbreviations of EU-27 countries in Eurostat website.

Executive summary

The working paper refers to: (a) the **Candidate Countries (CC):** Croatia, FYROM, Montenegro and Turkey: They have adopted the NUTS classification (b) the **Potential Candidate Countries** (PCC): Albania, Bosnia & Herzegovina, Serbia and Kosovo under UN Security Council Resolution 1244.

(1) Objective of the research

Objective of our research is to **assess the availability and quality of data for the indicators which reflect better the territorial cohesion in the Western Balkans countries and Turkey.** Thus, interested stakeholders could extend their territorial analyses in these countries, at least for the main facets of territorial cohesion.

We assessed the availability and quality of data for a large number of TC indicators. Now when the list of headline and core TC indicators is defined we can advance to a more in depth assessment based on these indicators.

We have implemented the following methodological steps:

- We have examined **the NUTS / LAU classification in the CC/PCC** (see in section 2)
- Next, we have commented the **feasibility of the INTERCO headline / core and final indicators** of different kinds as for the **data availability** in the CC / PCC (section 3)
- Then (in section 4) we have produced a **general overview of the development of the CC/ PCC in the European frame on the basis of existing literature** and we have analysed the different TC dimensions at country (NUTS0) and macro (overall CC/ PCC) levels
- Next, **we have used these indicators for the analysis of the territorial cohesion pattern in these countries** at NUTS-2 level and NUTS-3 level, the latter being more "territorial" (section 5). This exercise enabled us to **test the effectiveness of these indicators**
- Thus, finally (section 6), we have produced **conclusions** on the TC in CC/PCC, on the effectiveness and the gaps of the methods of exploitation of TC indicators used. We have also proposed recommendations to interested stakeholders on the appropriate improvement of their work on territorial data on these countries.

(2) NUTS / LAU classification in the CC / PCC

In the frame of the ESPON 2013 Database-1 project, in order to ensure a sound comparability **of data of the CC/PCC which have not adopted the NUTS classification**, the existing administrative units of these countries have been classified at different territorial levels in **"similar NUTS"** territorial units.
For this purpose the **criterion of population potential** of the EU NUTS classification has been used as well as the **overall structure of government** in these countries **with focus on the power of the respective regional and local authorities** and the **main features of territorial development** in each administrative level per country.
The "similar NUTS" divisions correspond almost fully with the respective divisions for the EU countries.
In the frame of INTERCO, we have checked the above classification and made necessary modifications and additions to the reasoning for the classification.

(3) Feasibility of "headline" / "core" and final indicators[1] as for the data availability in the CC / PCC.

We should first remind that ESPON 2013 Database-1 project has, in general terms, **focused on the NUTS3 level.** However, it referred only to some **"basic"** indicators at this level: GDP in Euros and GDP in PPS, area, total population, population density, population age pyramid, population by sex, crude birth rate, crude death rate, migration, natural Growth rate, active population, unemployment.

Following the scope of the entire INTERCO project, we have focused in the case of CC/PCC on a much larger range of indicators then the "basic". This range includes the **"headline"** / **"core" and final indicators** (see the previous footnote) which are defined by the "selection of indicators" task of INTERCO. Specifically, **we have assessed the feasibility of the above** as for the availability and quality of relevant data.
The latter data assessment showed that there are **available data at sub-national leve**l (NUTS2 or NUTS3 –which could be aggregated at national level) only for 9 **headline indicators** and for 5 others there is data **only at national level.** There is also data at national and / or sub-national level for the limited number of core indicators which have been examined. Finally, there are data **at sub-national leve**l only for 7 "final" indicators.

Data sources:
The data for **Croatia, FYROM and Turkey** are mostly from Eurostat, but data from NSO and other sources have also been added. For Montenegro and the **PCC**, Eurostat provides data only at NUTS0 level – therefore, additional data should be used from the National Statistical Organizations (NSO) and other sources. In general terms, for a number of headline indicators there are for the PCC only data at NUTS0 (country) level.

(4) Territorial cohesion trends at the macro level (overall CC/PCC) and the country level

The literature review which is mainly based on **country level (NUTS0) data** for these countries, has shown that the respective **Territorial Cohesion (TC) pattern in the CC/ PCC differs considerably from that for the EU-27.**
The EU-27 space could be divided in general terms regarding TC in **three distinct patterns":** those of the EU "Northern" countries, the "Southern" countries and "Eastern" countries. The CC/ PCC: W. Balkans and Turkey, could be reasonably associated to a **fourth territorial cohesion pattern**, the TC indicators of which are in general lines "worse" than the indicators of the "Eastern" countries, regarding all the TC "dimensions" examined: competitiveness, inclusion, environment quality, energy, connection and territorial structure.

(5) Analysis of territorial cohesion in the CC / PCC on the basis of feasible headline indicators - effectiveness of these indicators

In this section we have analysed in more detail TC in the CC/ PCC on the basis of both national and sub-national level (NUTS2-NUTS3) data as a major objective of our re-

[1] The list of the "final" indicators (or "top" indicators) of the project has been developed very recently. Furthermore, the list will be really "final" after the submission of the dFR and the comments of the ESPON CU. So we have taken it into account as much as it was possible. We will take it into account fully towards the Final Report.

search is exactly to see **how the TC pattern of the CC/ PCC at the sub-national level differs from the respective pattern at national level**.
Because the respective data are scarce, we have examined only six indicators: three indicators of the TC dimension “competitiveness”: GDP rate per capita, regional GDP dispersion and unemployment and three indicators of “inclusion”: ageing index (people aged 65+/ total population), life expectancy at birth and population density.

We have specifically examined several types of indicators of variation (min / max, mean (average), standard deviation and coefficient of variation) at national (NUTS0) and sub-national level and examined how these statistics reflect the inequalities regarding TC.

(6) We concluded that the TC pattern in the CC/PCC differs clearly from that of the EU-27, while it is close to that of the EU east. However it differs from this last as for several aspects of TC dimensions. The pattern of inequalities by issue at national level differs considerably from that for the sub-national level.

While the results taken from the exploitation of the TC indicators go further than the existing literature, important weaknesses remain regarding the weights of the impacts of the different TC aspects to each TC dimension and to the “global” TC in these countries.

1. Introduction and methodological remarks

The CC / PCC[2]

This working paper examines territorial cohesion indicators in the ***Western Balkans countries and Turkey***.
Western Balkans countries and Turkey are ***Candidate Countries (CC)*** or ***Potential Candidate Countries (PCC)***. Specifically:

According to the overall enlargement strategy of the EU document adopted by the Commission on 8.11.2006 (http://ec.europa.eu/enlargement/countries/index_en.htm) ***Croatia*** and ***Turkey*** are ***Candidate Countries***. In December 2005, the European Council granted the ***Former Yugoslav Republic of Macedonia (FYROM)*** the status of a ***Candidate Country***; The European Council of 16-17.12.2010 agreed to give ***Montenegro*** the status of ***Candidate country***; accession negotiations with the latter two countries have not started.

The statistics of Montenegro are not fully adapted to the EU statistics rules as it is the case for Croatia, FYROM and Turkey. They adapt gradually to these rules. Thus, in some of the following parts of the paper, we have included Montenegro in the Potential CC.

Albania, Bosnia and Herzegovina and Serbia including Kosovo (Under UN Security Council Resolution 1244) are ***Potential Candidate Countries***: See in more detail in the 8.11.06 document and the corresponding following documents.

Objective of the research and methodological steps

In the frame of the **INTERCO project** we are interested to assess the availability and quality of data **for the indicators which reflect better the territorial cohesion in the Western Balkans countries and Turkey.** Thus, interested stakeholders could extend their territorial analyses in these countries, at least for the "headline" facets of territorial cohesion.

Specifically:

- We have examined shortly **the NUTS / LAU classification in the CC/PCC and the availability of a set of "basic" data in these countries.**
- Then, we have prepared a set of **hypotheses on the trends and driving forces of territorial cohesion in the CC / PCC on the basis of existing literature.**
- Next, we have assessed the **feasibility of "headline" / "core" and "final" indicators** of different kinds **for the case of CC / PCC.**
- Then we have **used these indicators for the analysis of territorial cohesion in these countries.**
- This exercise has enabled us to **test the effectiveness of these indicators**

[2] A first version of this paper was submitted to the LP on June 2011, therefore it has taken into account the priority indicators selected at this time ("headline" and "core"). In this updated version we have taken into account as much as possible the latest selection of "final" indicators

- Thus, finally, we were able to propose **recommendations to interested stakeholders** (ESPON, DG Regio, Eurostat, CC / PCC NSOs) on the **appropriate improvement of their work on territorial data on these countries.**

Territorial cohesion indicators to be examined

In the frame of INTERCO[3], we have worked on a set of indicators *which reflect better territorial cohesion in CC / PCC.* As such indicators, we will use those which are defined by the "selection of indicators" task of INTERCO.

Specifically, we have used:

(a) The INTERCO **"headline"** indicators as well as a limited number of **"core"** indicators -see in the respective section of the INTERCO Interim Report.

Headline indicators are indicators (around 20) that have the highest explanatory power and the highest relevance for the issues and policies at stake -see in the Annex 2. **Core indicators**: these indicators complement the headline indicators in the analysis of the main issues and policy objectives. These indicators were identified as very important either in the policy documents, or by the participants of the INTERCO workshops or by the expertise of the INTERCO team.

(b) A number of the INTERCO **"final" indicators** which are not included in the list of the "headline" and "core" indicators[4]. The list of indicators was not fully finalised during the progress of this working paper. They will be fully taken into account for the Final Report. See in detail in the section 3.1.2.

2. The NUTS / LAU classification in the CC / PCC

2.1. General assessment

In order to be able to work on the above indicators and the respective data, we have used the **EU NUTS / LAU classification** per country (Eurostat RAMON NUTS classification 2011). For the cases of the CC / PCC where such classification does not exist, we have used a respective appropriate classification. The ESPON 2013 Database -1 project has created a relevant classification which has been used in INTERCO as a starting point.

In more detail:

In the frame of the ESPON 2013 Database -1 project, In order to ensure a sound comparability of data of the CC and PCC which have not adopted the NUTS classification, the existing administrative units of these countries have been classified at different territorial levels in **"similar NUTS"** territorial units.

[3] The ESPON 2013 Database -1 project has done an in depth assessment of the availability and quality of data in the CC/PCC (Angelidis et al 2011). However, this referred only to some "basic" indicators –as these were defined in the frame of this project. Therefore, we have used some parts of this analysis, although we have extended it in order to cover a much more important number of indicators.

[4] We underline that in the first phase of INTERCO (towards the Inception Report) we had assessed the availability and quality of data for a larger number of indicators. See the respective Tables attached to the INTERCO Inception Report.

For this purpose the **criterion of population potential** of the EU NUTS classification has been used as well as the **overall structure of government** in these countries **with focus on the power of the respective regional and local authorities** and the main **features of territorial development** in each administrative level per country.

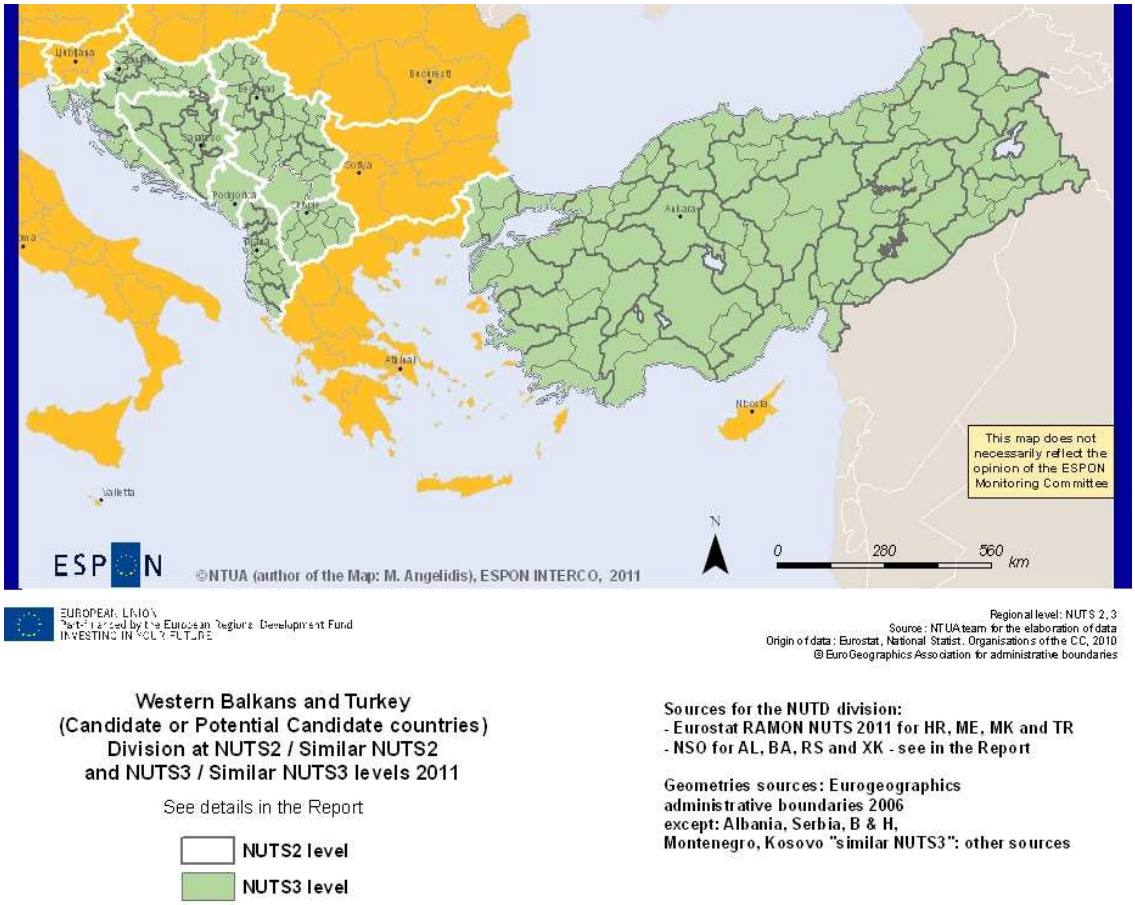
The implementation of this method ensured that the “similar NUTS” divisions correspond almost fully with the respective divisions for the EU countries.

While ESPON 2006 Database as well as several relevant to the CC / PCC studies in the frame of ESPON 2006 focused mainly on NUTS2 data, ESPON 2013 Database project has, in general terms, extended the scope of the Database to NUTS3 level data. In this line, the work on CC / PCC in the last project focused on the NUTS3 level.

The ESPON INTERCO project aims to highlight the territorial aspects of cohesion through the use of appropriate indicators; therefore it should focus on the NUTS-2 and even more on the NUTS-3 level for the case of the CC / PCC. Indicators at LAU level, which is even more appropriate level for TC, are examined in the frame of INTERCO only through case studies – see in the main Report of the dFR.

Therefore, in the frame of INTERCO, we have checked the NUTS classification used in the ESPON 2013 database project. Only a few new developments which are of minor importance on this issue which have occurred from 2010 until now or complement the discussion on the definition of “similar” NUTS for some PCC have been added: (a) in the case of Montenegro, the correspondence of one NUTS-3 unit to the NUTS-0 (country) area have been consolidated as “official” after the status of candidate country has been granted to Montenegro (see in Eurostat RAMON NUTS 2011) (b) proposals made for the division of the Republic of Srpska of Bosnia and Herzegovina in NUTS-3 units.

We present in the ***Map 2.1.1*** the overall division of the CC/PCC in NUTS-2, 3 and Similar NUTS-2, 3 units.



Map 2.1.1: NUTS-2 and 3 units of the Western Balkans countries and Turkey (CC/PCC)

We present in extent the definition of this classification according to the Eurostat RAMON NUTS 2011 in Annex 1.

In section 2.2, we discuss in more detail the specific to each candidate / potential candidate country features of this classification.

2.2. Specific features for the administrative divisions / territorial levels per country

Albania

***Spatial units' levels*:**

The ***total population of the country*** amounted up to ***3.170.000 inhabitants*** in ***2008*** (Eurostat 2010).

Albania is divided into 12 prefectures (counties, Albanian: official qark/qarku, but often prefecture / prefektura), 37 districts and 351 municipalities.

Albania's prefectures could be assimilated to NUTS3 - Map 2.2.1 (AL).

There is not an official territorial division which could be assimilated to ***EU NUTS2 division***. Several scenarios are now examined in the context of the EU – Albania collaboration.

Map 2.2.1 (AL): Albania similar NUTS2 and 3 units, Population per similar NUTS3 2001

Bosnia and Herzegovina

Spatial units' levels:

The ***total population of the country*** amounted up to ***3.843.000 inhab.*** in ***2008*** (Eurostat 2010).

Bosnia and Herzegovina is divided into three entities*: Federation of Bosnia and Herzegovina (FBiH), Republic of Srpska (RS), and Brčko District*, which was established in 2000 out of land from both entities (It officially belongs to both, but is governed by neither, and functions under a decentralized system of local government).

The ***"similar NUTS2 level"***:

According to the respective population criterion: 800 000 - 3 million inhabitants, both FBiH and RS could be assimilated to NUTS2. Regarding also the administrative power / capacity criterion, these units could be assimilated to NUTS2. However, evidently, in the case of Bosnia and Herzegovina, the political criterion would be taken primarily into account, therefore even Brčko District could be assimilated to NUTS2.

The ***"similar NUTS3 level"***:

FBiH is divided in **10 cantons** *-Map 2.2.2 (BA)-* and 79 municipalities; Republic of Srpska has 62 municipalities; City of Brčko is a separate administrative unit - District.

The 10 cantons of FBiH could be assimilated to NUTS3.

For the RS there is not official division in NUTS-3 units. There are two main approaches of this division: (a) The division proposed by the Institute of Statistics which admits six counties: Banja Luka, Doboj, Bijeljina, East Sarajevo, Foca and Trebinje (b) The proposal of the Spatial Plan of Republic of Srpska, adopted in 2007 which emphasizes the necessity of establishing regional policy and proposes accordingly the division of the country into the following NUTS-3 units: Prijedor, Banja Luka, Doboj, Bijeljina, East Sarajevo and Trebinje (see, among others, in Mutabdzija 2006).

Map 2.2.2 (BA): Bosnia and Herzegovina similar NUTS2 and 3 units, Population per similar NUTS3 2001

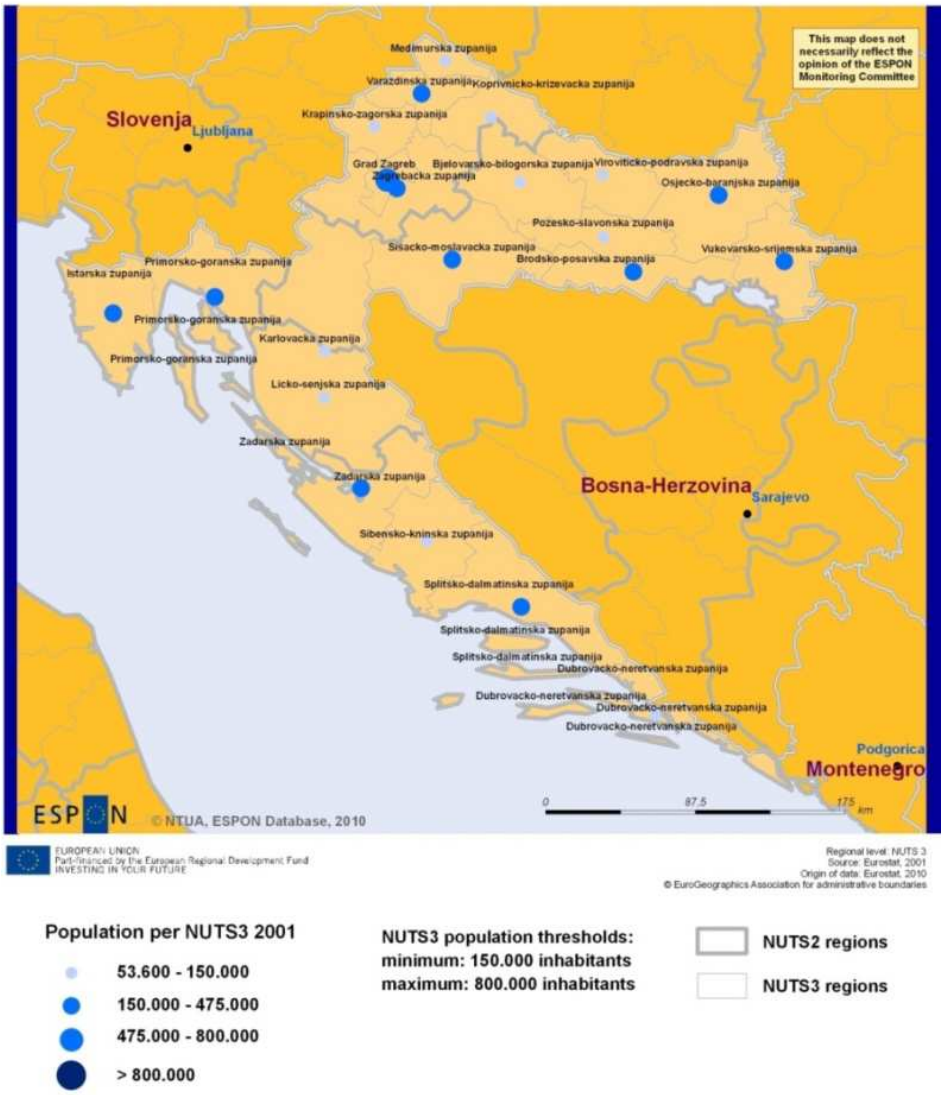
Croatia

Spatial units' levels

The ***total population of the country*** amounted up to ***4.456.096 inhab.*** in ***2011*** (NSO of Croatia – First results of the population census of 2011)***.***

- Croatia has already adopted the EU NUTS (1, 2, and 3) classification as follows:

NUTS 1: Country (Hrvatska), NUTS 2: Regija (3), NUTS 3: Counties / Jupanija (21). See in the ***Map 2.2.3 (HR)***.



Map 2.2.3 (HR): Croatia NUTS2 and 3 units, Population per NUTS3 2001

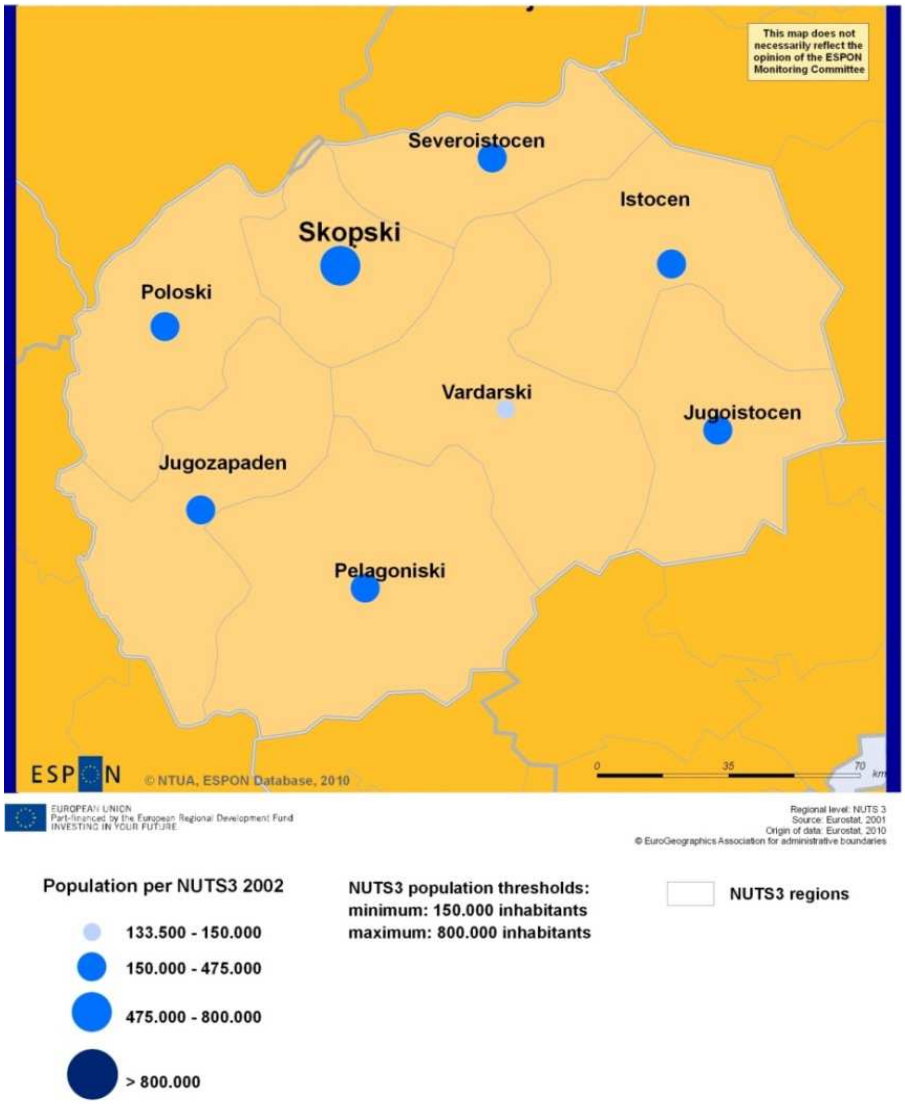
FYROM

Spatial units' levels

The ***total population of the country*** amounted up to ***2.045.000 inhab.*** in ***2008*** (Eurostat 2010).

FYROM has already adopted the EU classification of spatial units in NUTS; by level:

NUTS 1 and NUTS 2: Country, NUTS 3: Eight (8) Statisticki Regioni / Statistical Regions – See in the ***Map 2.2.4 (MK).***



Map 2.2.4 (MK): FYROM NUTS2 and 3 units, Population per NUTS3 2001

Serbia

Spatial units' levels

The ***total population of the country*** amounted up to ***7.120.666 inhabitants*** in ***2011*** (NSO of Serbia – First results of the population census of 2011).

The "similar NUTS3" level

Serbia is divided into two parts: the ***Central Serbia*** and the autonomous province of ***Vojvodina*** and further into **24 districts** (excluding Kosovo) plus the **City of Belgrade**.

The districts and the City of Belgrade are further divided into 157 municipalities – See in ***Map 2.2.5 (RS)*** (the "similar NUTS2" divisions in the Map do not correspond to the recent official division of the Serbia territory in NUTS2 units –see in next)

- Districts could be reliably assimilated to NUTS3

The "similar NUTS2" level

According to the recent available documentation (to be used with caution)

(Wikipedia http://en.wikipedia.org/wiki/Statistical_regions_of_Serbia as of 10.1.2011)

Serbia is divided into **five statistical regions in accordance to NUTS 2**, which are in turn grouped **into two higher NUTS 1 statistical units (North and South**).

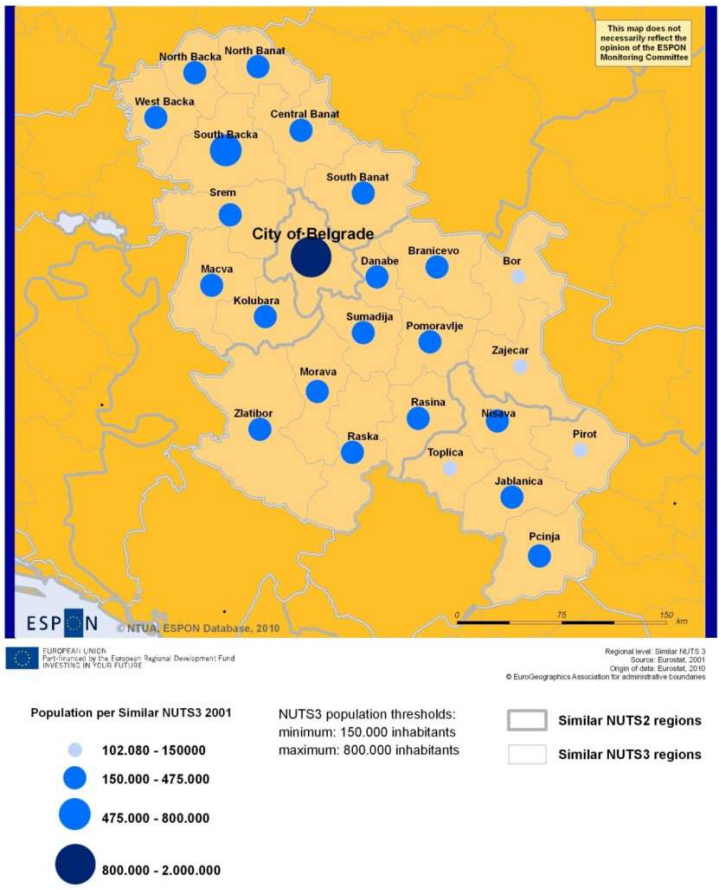
In 2009, the Serbian parliament adopted the Law on Equal Territorial Development that formed seven statistical regions on the territory of Serbia. The Law was amended on 7 April 2010, so that the number of regions was reduced to five –see in ***Figure 2.2.6 (RS).*** The Eastern Serbia region was merged with Southern Serbia and Šumadija was merged with Western Serbia.

According to the above, the statistical regions and their NUTS codes are:

RS: Serbia

- RS1: Serbia - North
  - RS11: Belgrade
  - RS12: Vojvodina
- RS2: Serbia - South
  - RS21: Šumadija and Western Serbia
  - RS22: Southern and Eastern Serbia
  - RS23: Kosovo and Metohija

If we take into account the population criterion, the two Serbian provinces (plus, eventually, the City of Belgrade) could be assimilated to NUTS 2.
As we have mentioned, the statistical NUTS1 and NUTS2 regions created by the government in order to meet the NUTS criteria as well as the requirements of the EU regional policy, do not have actually a considerable administrative power; also, they are not self-governed entities. The political criterion prevailed for their creation.



Map 2.2.5 (RS): Serbia similar NUTS2* and NUTS3 units, Population per similar NUTS3 2001

* Estimation in 2009, before the reform of 2010 –see in next

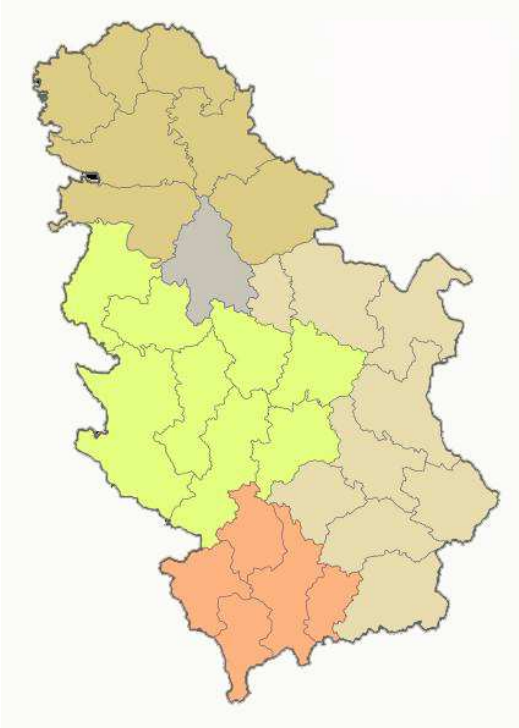


Figure 2.2.6 (RS): Serbia "similar NUTS2" according to the 2010 reform

Source: Wikipedia 2010

Montenegro

Spatial units' levels

The ***total population of Montenegro*** amounted in ***625.266 inhabitants*** in ***2011*** (NSO of Montenegro – First results of the population census of 2011).

As we have already mentioned, Montenegro has been recognised as candidate country at the end of 2010. In 2011 the country has been included in the Eurostat NUTS classification. In this frame, ***the total of the country corresponds to NUT1, NUTS2 and NUTS3 level – see in the Map 2.1.1.*** Obviously, it has been taken into account that according to the EU regulation limits for NUTS 3 spatial units their population should range between 150.000 and 800.000 inhabitants and only the municipality of Podgorica had more than 150.000 inhabitants (169.132) in 2003.

The country is divided in 21 *municipalities* which could be assimilated to *LAU1* level.

Kosovo (Under UN Security Council Resolution 1244)

Spatial units' levels

The ***total population of Kosovo*** amounted up to ***2.153.000 inhabitants in 2008*** (Eurostat 2010).

Republic of Kosovo is divided in **seven districts** and 30 municipalities.

According to the EU regulation limits for NUTS 3 spatial units their population should range between 150.000 and 800.000 inh; the population of more than the half of the Kosovo districts surpasses 150.000 inhabitants, therefore *the districts could be (difficultly) assimilated to NUTS 3 units.* Municipalities could be assimilated to LAU1 level.

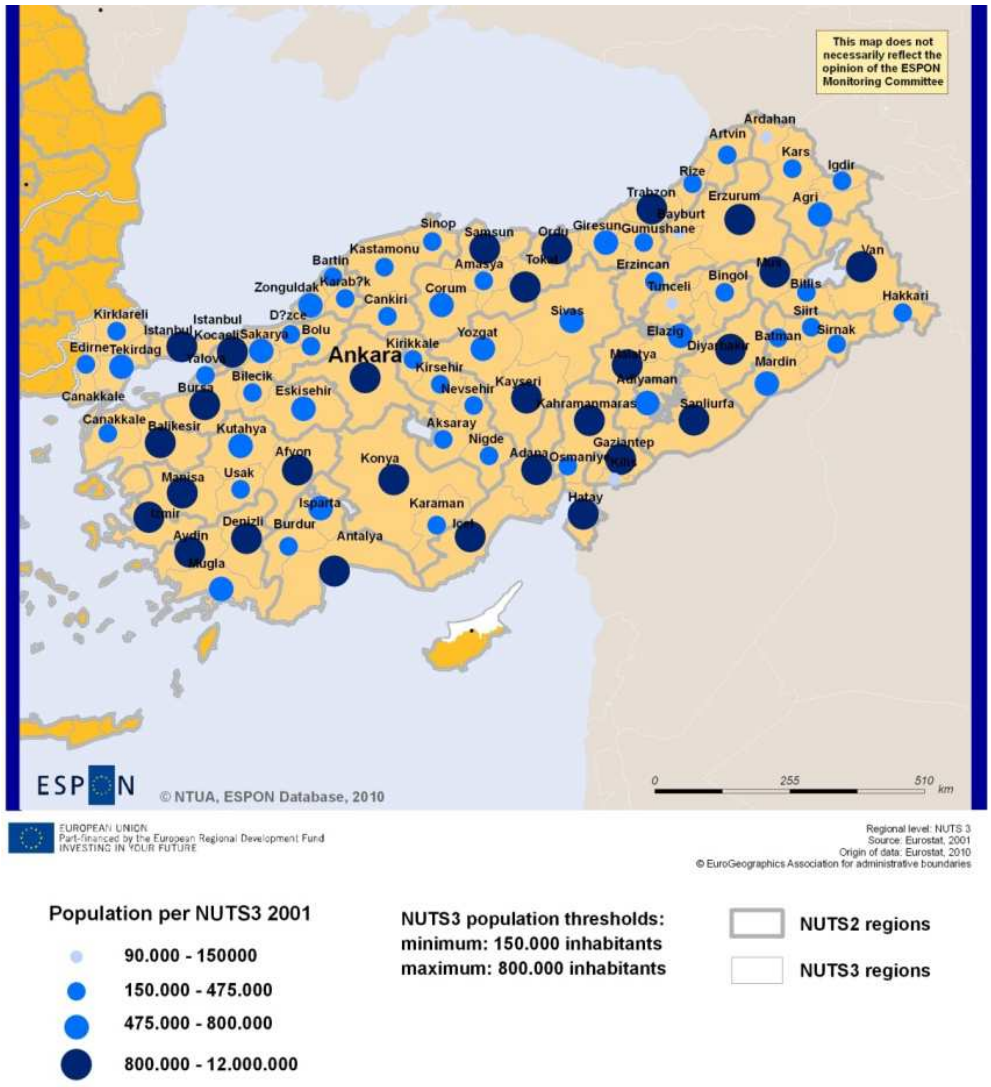
Turkey

The ***total population of Turkey*** amounted in ***70.586.000 inhabitants*** in ***2008*** (Eurostat 2010).

Spatial units' levels:

Turkey, which has adopted the EU NUTS/LAU system, has:

- 12 NUTS1 units (Regions, BΦLGELER in Turkish),
- 26 NUTS2 units (Sub-regions, ALT BΦLGELER in Turkish) and
- 81 NUTS3 units (Provinces, ILLER in Turkish) –see in the ***Map 2.2.7 (TR).***



Map 2.2.7 (TR): Turkey NUTS2 and 3 units, Population per NUTS3 2001

2.3. Conclusions: Compatibility of "similar NUTS" divisions with the EU NUTS classification

Turkey, Croatia, Montenegro and FYROM have already adopted the NUTS classification.

For the rest WB countries, the results of the respective assessment per country, using the criteria of the population weight (formal criterion) together with the administrative capacity (informal criterion) -see for the methodology in the Introduction- ensured that the "similar NUTS" divisions used correspond almost fully with the respective divisions for the EU countries; Therefore, the "similar NUTS" could be used for the work on data without considerable problems.

3. Feasibility of the INTERCO headline / core and final indicators as for the data availability in the CC / PCC

3.1. General assessment

3.1.1. The ESPON 2013 Database-1 "basic" data / indicators

In line with the scope of the entire ESPON 2013 Database -1 project, the following **"basic"** themes and corresponding datasets which contain 132 indicators (themes x indicators per theme x years) for the CC/PCC have been elaborated and **integrated in the Database.**

- GDP in Euros and GDP in PPS
- Area
- Total population
- Population density
- Population age pyramid
- Population by sex
- Crude birth rate
- Crude death rate
- Migration
- Natural Growth rate
- Active population
- Unemployment

3.1.2. The INTERCO headline / core and final indicators

INTERCO approaches territorial indicators differently from the ESPON Database as it focuses on territorial cohesion ones.

In a first phase it considered the following five categories of indicators -see the Note on the criteria for the thematic selection of indicators (sent to ESPON CU on 11.5.2011) complementing the Interim Report- :

1. **Synthetic/composite (headline) indicators**, i.e. the simplification of several indicators into one single index summarising all the underlying dimensions of the issues and policies at stake (8 indicators);

2. **Headline indicators**, i.e. a limited number of indicators (31) that have the highest explanatory power and the highest relevance for the issues and policies at stake;

3. **Core indicators**: these indicators complement the headline indicators in the analysis of the main issues and policy objectives (28 indicators) -see in detail in the above mentioned Note.

4. **Analytical indicators**, i.e. a full set of indicators that provide additional insights for the issues and policies at stake;

5. **Other data** (that may once become indicators under different circumstances, i.e. if issues of interest or policy objectives are modified).

Assessment of the headline and core indicators

The TPG decided to focus in a first phase on the headline and core indicators for the entire ESPON space. **In the case of the CC/PCC, we focused in this first phase in the headline indicators** as in the case of the CC/PCC it is generally much more difficult to estimate the feasibility of core, analytical and other indicators as for the existence of relevant data –see in Table 3.1. Specifically, we have examined in depth only one of the **core indicators**: *population density* as it is very important and there are

available data at sub-national level. However, we have already done a first assessment of the availability of data for the CC/PCC for all core indicators (Table 3.2).

Table 3.1: INTERCO headline indicators

Thematic category name	Thematic sub-cat. nr	Thematic sub-category name	Indicator name	Data availability * - national level	Data availability * - sub-national level
DEMOGRAPHY	2,01	Population Structure	Ageing index (persons 65+ / persons 0-14)	+	+ **
	2,01	Population Structure	Dependency rate		
	2,01	Population Structure	Life expectancy at birth	+	+ **
	2,01	Population Structure	Life expectancy		
	2,03	Total population	Population potential within 5 km		
	2,03	Total population	Population average annual growth	+	+ **
ENERGY	4,01	Energy	Share of renewable energy in final energy consumption and increase needed to meet the 20% target	+ *	
SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE	6,02	Education	High education population		
	6,02	Education	Share high educated population in percent	+ *	+ **
	6,02	Education	Population aged 30–34 with a tertiary education in 2008 and distance to Europe 2020 target (5th CR)		
	6,02	Education	Share of tertiary educated people in %	+ *	+ **
	6,03	Health	Healthy life expectancy (ESPON 3.2)		
	6,03	Health	Self-perceived personal state of health in EU Member States (5th CR)		
	6,04	Poverty	At persistent risk of poverty rate (Population share with 60 % of the national equivalent median income)	+ *	
	6,04	Poverty	Share of population living in workless or low work intensity households (5th CR)	+ *	
	6,05	Other social	Work-life balance in EU Member States (5th CR)		
	6,07	Quality of life	Happiness Index		
	6,07	Quality of life	Share of population reporting crime, violence or vandalism by degree of urbanisation (5th CR)		
ECONOMY, LABOUR FORCE	7,02	Employment, Unemployment	Difference between female and male employment rates, 20–64	+ *	+ **
	7,02	Employment, Unemployment	Employment rate change (growth)	+	+ **
	7,02	Employment, Unemployment	Unemployment rate per age: classes of 5 years	+ *	+ **
	7,02	Employment, Unemployment	Development of unemployment rate (male, female, young, total, 99-04)	+ *	+ **
	7,03	Income and Consumption	GDP per inhabitant (capita) in PPS or Euros, per year	+	

	7,03	Income and Consumption	GDP change per inhabitant (capita) in PPS or Euros	+ *	
	7,03	Income and Consumption	Median disposable annual household income		
	7,04	Investments, Finances and Expenditures	Public sector debt relative to GDP		
ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS	8,01	Environment quality	NATURA 2000 area (Share of Natura 2000 area in %) (5th C.R.)		
	8,02	Natural assets	Consumption of water per capita		
GOVERNANCE	9,01	Governance	Electoral participation		
	9,01	Governance	WGI Index on voice and accountability		
NON - CROSS-THEMATIC DATA	99,01	Integrative indices and typologies	Intensity of multiple risks (number of challenges) for European Regions ("Regions 2020")		

* In some cases the definition of the data on CC/PCC differs to some extent from that of the EU-27 data
** Only for some CC / PCC

Table 3.2: INTERCO "core" indicators

Thematic category name	Thematic sub-cat. nr	Thematic sub-category name	Indicator name	Data availability * - national level	Data availability * - sub-national level
DEMOGRAPHY	2,03	Total population	Population density	+	+ **
	2,04	Urban - rural population	Urban - rural population in Europe based on national classification		
TRANSPORT, ACCESSIBILITY, COMMUNICATION	3,03	Accessibility	Potential accessibility to GDP by road		
	3,03	Accessibility	Potential accessibility to population by road		
	3,03	Accessibility	Time to the nearest motorway access		
	3,03	Accessibility	Travel time to railway stations		
ENERGY	4,01	Energy	Energy intensity of the economy		
	4,01	Energy	Renewable energy consumption		
SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE	6,02	Education	Early school leavers and distance to Europe 2020 target - 5th CR	+**	
	6,03	Health	Health expenditure per capita	+**	+**
	6,03	Health	Expenditure on health as part of GDP (national level)		
	6,04	Poverty	Number of homeless people as a proportion of total resident population		
	6,04	Poverty	Population suffering from severe material deprivation (% of total population)		
	6,07	Quality of life	Happiness and GDP per head		
	6,07	Quality of life	Homicide rate		
ECONOMY, LABOUR	7,01	Labour force	Labour productivity, gross domestic product as PPP per person employed	+	+ **

FORCE	7,02	Employment, Unemployment	Employment rate change %, 20–64 years, in certain time period and distance to Europe 2020 target		
	7,07	Innovation	% of households having broadband access	+	+ **
	7,07	Innovation	Human Resources in Science and Technology	+	+ **
	7,07	Innovation	GERD (Gross domestic expenditure on research and development)	+	+ **
ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS	8,01	Environment quality	Residence density		
	8,01	Environment quality	Urban waste water treatment capacity		
	8,02	Natural assets	Share of areas with high ecological value		
	8,02	Natural assets	Dwellings connected to potable water system		
	8,02	Natural assets	% of green space per inhabitant		
	8,03	Climate change	Greenhouse gas emission	+	+ **
GOVERNANCE	9,01	Governance	Trust in the legal system (Share of persons having complete trust/ no trust at all in the legal system of a country)		
TERRITORIAL STRUCTURE	10,01	Urban structure	MEGA / Metropolitan European Growth Areas		

* In some cases the definition of the data on CC/PCC differs to some extent from that of the EU-27 data
** Only for some CC / PCC

We present in the **Table 3.4 of the Annex 2** (in Excel format) the available data on the CC/PCC **for the INTERCO headline and core indicators per theme, territorial level, time series and source.**

These data are coming from all available sources: **Eurostat, National Statistical Offices and other sources** and covers the years 2000 - 2010 (and fore some cases from 1995) and NUTS 0, 1, 2 and 3 or “similar NUTS” 1, 2 and 3 levels.

More specifically:

- For Croatia, FYROM and Turkey most of the data is from Eurostat, but other data has been added from NSO and other sources.

- For the rest CC / PCC, Eurostat provides data only at NUTS0 level –see in next; therefore, data from the National Statistical Organisations (NSO) and other sources has mainly been used. We remark that for the country (NUTS 0) level, Eurostat data for the CC / PCC cover a very wide range of themes as we have already seen in section 3.

Regarding the coverage rate of the CC / PCC per indicator, the situation varies considerably according to the country -see in Table 3.4 of the Annex 2..

Assessment of the “final indicators

See in the Table 3.3.

Obviously there are not available data for the CC/ PCC for a considerable number of INTERCO final indicators. See also in Table 3.5 of the Annex 2..

Table 3.3: INTERCO "final" indicators

Territorial objectives	indicator name	Data availability * - national level	Data availability * - sub-national level
Strong local economies ensuring global competitiveness	Labour productivity in industry and services		
	GDP per capita in PPP	+***	+**
	Overall unemployment rate	+	+**
	Old age dependency ratio	+	+**
Innovative territories	Population aged 25-64 with tertiary education		
	Intramural expenditures on R&D		
	Employment rate 20-64	+	+**
Fair access to services, market and jobs	Access to compulsory school		
	Access to hospitals		
	Accessibility of grocery services		
	Access to university		
	Accessibility potential by road	****	****
	Accessibility potential by rail	****	****
	Accessibility potential by air	****	****
Inclusion and quality of life	Disposable household income		
	Life expectancy at birth	+**	+**
	Proportion of early school leavers		
	Gender imbalances		
	Different female-male unemployment rate	+	+**
	Ageing index	+	+**
Attractive regions of high ecological values and strong territorial capital	Potential vulnerability to climate change (ESPON Climate)		
	Air pollution: PM10		
	Air pollution: Ozone concentrations	+*****	
	Soil sealing per capita		
Integrated polycentric territorial development	Population potential within 50 km		
	Net migration rate	+**	
	Cooperation intensity (number of common projects between partners, from ESPON TERCO)		
	Cooperation degree (the number of regions cooperating with each other)		

* In some cases the definition of the data on CC/PCC differs to some extent from that of the EU-27 data
** Only for some CC / PCC (usually: HR, MK and TR)
*** GDP per capita in Euros
**** Calculations are possible for some of the CC/ PCC
***** Total greenhouse gas emissions (CO2 equivalent (1990=100)

3.2 Analysis per country

Albania

Existing data at "similar NUTS3" level

(1) Official statistical data:

Data at the level of ***prefectures ("counties") / similar NUTS 3****:*

- From the *population censuses of 1989 and 2001:*

(a) Population: total, distributions: per sex and age group, per education level

(b) Active population (total, distributions: per sex), number of employed and unemployed persons, employment per primary secondary and tertiary sector.

- From the housing census of 2001

The *Labour Force Survey of 2007* refers to the national level.

Moreover, some research about *population projections 2001-2021, gender perspectives, people and work and living conditions and inequality* exist only for national level or the level of regions (north, centre except from Tirana – Durres, South and Tirana – Durres).

Bosnia and Herzegovina

Existing data at "similar NUTS3" level

(1) Official statistical data:

Data at the level of 3 entities: Federation of Bosnia and Herzegovina (FBiH), Republic of Srpska (RS) and Brsko District.

- From the population census of 1991:

  (a) Population: total, distributions: per sex and age group, per education level

  (b) Active population (total, distributions: per sex), number of employed and unemployed persons, employment per primary secondary and tertiary sector.

- From the population official estimate 2008 (for the FBiH):
  Population per sex age etc, active population etc – see above.
- From the Labour Force Survey, carried out in 2007: total active population and its sex distribution, number of employed and unemployed persons, employment per primary, secondary and tertiary sector.

Data on the GDP exist for the FBiH and RS– at entity level.

Data at the level of cantons:

Population 2008 from the population official estimate 2008 –only for the FBiH.

(2) Data on land uses and environment -from CLC, UMZ.

Croatia

Existing data at NUTS3 level

(1) Official statistical data:

*Data at **NUTS3 level**:*

- From the population censuses of 1991 and 2001:

  (a) Population: total, distributions: per sex and age group, per education level
  (b) Active population (total, distributions: per sex), number of employed and unemployed persons, employment per primary secondary and tertiary sector.
- From the population census of 2011 (provisional results): Population: total, distribution per sex
- From the population, *households and dwellings* census 2001 (31st March 2001).

(2) Data on land uses and environment -from CLC, UMZ.

Data at National level: Labour force survey -First Quarter of 2008.

FYROM

Existing data at NUTS3 level

(1) Official statistical data:

Data at the level of "Statistical Regions" / NUTS 3 (by aggregation of municipalities' data):

- From the population censuses of 1991 and 2002:

  (a) Population: total, distributions: per sex and age group, per education level

  (b) Active population (total, distributions: per sex), number of employed and unemployed persons, employment per primary secondary and tertiary sector.
- From the population, *households and dwellings* census 2002
- Specific surveys: labour force survey etc.

(2) Data on land uses and environment -from CLC, UMZ.

Serbia

Existing data at "similar NUTS3" level

(1) Official statistical data:

Data at the level of municipalities and districts / similar NUTS 3 (by aggregation of municipalities' data):

-From the population censuses of 1991 and 2002:

(a) Population: total, distributions: per sex and age group, per education level

(b) Active population (total, distributions: per sex), number of employed and unemployed persons, employment per primary secondary and tertiary sector.

There also data on population (distribution per age, sex etc) from a very recent -2008- official estimate.

-From the population census of 2011 (provisional results): Population: total, distribution per sex at LAU (municipality) and NUTS-3 level

(2) Data on land uses and environment -from CLC. There are data from CLC2006 but there are not data on UMZ (2009 documentation).

Most of the data concerning censuses of the population and building, specific surveys etc are aggregated and published on the level of *municipalities (LAU1).*

Montenegro

Existing data at NUTS3 level

(1) Official statistical data:

Data are available *mainly for the total of the country*

- From the population censuses of 1991 and 2003:
  (a) Population: total, distributions: per sex and age group, per education level
  (b) Active population (total, distributions: per sex), number of employed and unemployed persons, employment per primary, secondary and tertiary sector.
- For the education level, the available data exist only in the census of 2003.

(2) Data on land uses and environment -from CLC, UMZ.

Kosovo (Under UN Security Council Resolution 1244)

Existing data at "similar NUTS3" level (2009)

(1) Official statistical data:

Data at the level of districts / similar NUTS 3:

- From the population census of 1991 (only)

(a) Population: total, distributions: per sex and age group, per education level

(b) Active population (total, distributions: per sex), number of employed and unemployed persons, employment per primary, secondary and tertiary sector.

- No data available on GDP.

(2) There are data from CLC 2006.

Data at national level:

Labour force survey 2002, Labour Market Statistics 2007

Turkey

Existing data at NUTS3 level

(1) Official statistical data:

- Data at ***district level***:

From 1990 and 2001 censuses and from the *2008 Population Census which used the Address Based Population Registration System:*

Population by age group and sex, Age dependency ratio, City and village population, Sex ratio, Population density.

- Data from periodic results of households Labour Force Survey for Turkey, Urban and Rural regions (results of 1988 – 1999 terms, results of 2000- October 2007, results of November 2007 and after = Address Based Population Registration System)

(2) There are data from CLC 2006

3.3. Conclusions for all CC / PCC

Data availability at level NUTS 0

In general, it is very satisfactory for all CC / PCC; most of the data are provided by Eurostat, additional data are provided by the National Statistical Offices (NSO).

Specifically, existing data cover many aspects of all the TC dimensions / aspects (defined by INTERCO) except from “governance”

Data availability at NUTS2 and 3 levels

- It is in general very satisfactory *for **Croatia, Montenegro, FYROM and Turkey**.* Data are fully comparable with the EU ones as these countries have adopted the NUTS classification. Available data from Eurostat cover at NUTS2 level a wide range of topics (see in the Annexes). They cover at NUTS3 level mainly the following aspects of TC dimensions:

- “Competitiveness” dimension aspects: economic accounts and labour market.

- “Inclusion” dimension aspects: demography.

Some additional data for specific topics are provided by the NSO of these countries.

- It is less satisfactory for the ***other Western Balkans countries*** (AL, BA, SR and XK); relevant data are provided by the NSO.

In more detail, at “similar NUTS3 level” of these countries:

(a) For the demography aspect of the TC dimension “inclusion” and the labour market aspect of the TC dimension” competitiveness”, it is good only for some of them while for the rest it is nearly acceptable.

(b) For the rest TC dimensions / aspects, there are important differences according to the country. Concisely, availability is more satisfactory for Serbia, much less satisfactory for the other PCC.

The data assessment on the CC / PCC showed that there are **available data at sub-national leve**l (NUTS2 or NUTS3 –which could be aggregated at national level) only for **nine headline indicators** and **seven “final” indicators**.
ageing index, life expectancy at birth, population average annual growth, share high educated population in percent, share of tertiary educated people in %, difference between female and male employment rates, employment rate change, unemployment rate per age, development of unemployment rate.

For 5 other indicators there is data **only at national level**:
Share of renewable energy in final energy consumption, population at persistent risk of poverty (rate), share of population living in workless or low work intensity households, GDP per capita in PPS or Euros, GDP change per capita.

See in the **Annex 2.**

4. Territorial cohesion in the CC/PCC at macro[5] and country levels and per TC dimension

As we have already pointed out, we should approach the specific aspects of territorial cohesion in the WB and Turkey in the wider frame of the **territorial challenges** in EU and the **EU policies' territorial priorities** as these last are defined mainly by the Europe 2020 targets and the 5th Cohesion report policy recommendations.

In this section we followed several **methodological steps:**

We start with a **general overview of the development of the CC/ PCC** –**sub-section 4.1**- according to different sources (EU, World Bank, other publications). This **literature review** has focused on the above specific themes / issues. It is mainly based on **country level (NUTS0) data** for these countries for a large number of mainly economic development themes. We should remark that other literature uses data at different territorial levels but these data are generally older and refer only to a limited number of themes.

Approaching territorial development by different levels is of primary importance for both analysis and planning. Thus, in the **sub-section 4.2,** we try **analyse at higher levels: country (NUTS0) and macro (overall CC/ PCC) levels, the different dimensions of the TC.** We used statistical analyses included in the Eurostat "Pocketbook on candidate and potential candidate countries" 2010 (2011) (referred in next as "Pocketbook"). Both analyses (our work as well as this one of the "Pocketbook") have been based on recent Eurostat data for the CC/PCC at country level.

In the **sub-section 4.3** we will do **overall (synthetic) conclusions on the territorial cohesion trends at macro and country levels.**

The **conclusions** for these levels are used as **hypotheses** for the **section 5** which analyses TC at **the lower levels (NUTS2/NUTS3 and beyond)** of the CC/PC.
As we have already stressed, the more appropriate level for properly "territorial cohesion" analyses is the **sub-national level**: NUTS2/NUTS3 and beyond**.** NUTS3 level is clearly more appropriate for territorial analyses than NUTS level.

As the necessary data at this level for the CC/PCC are scarce, we will examine only a limited range of indicators: the headline indicators and a limited number of core indicators. **This work will enable us to define a different, more in depth pattern of TC in the CC/PCC.**

Further on, from the scope of INTERCO it is very important to just compare the "country (NUTS0) level" TC pattern with the sub-national level TC pattern for the CC / PCC. This comparison enhance the results of the other sections of the project which refer to the entire ESPON space.

In order to use in the latter analysis feasible indicators as for the availability of data at lower (sub-national) level, we have already presented the assessment of this availability in section 3.

[5] Macro level = overall CC/PCC

4.1. General overview of the development of the CC/ PCC in the European frame

During the '90, a reconversion process similar to this of the Eastern European countries was undergoing in the **Western Balkans countries**: transition to the market economy, slow but continuous integration to the global economy, shrinking of the agriculture and industry, raise of the service sector, important economic development difficulties accompanied for some of the WB countries with decrease of the population. In most cases, capital cities attracted population and activities at the expense of the smaller cities and the countryside.

Economic development, social structures and environment conditions in Western Balkans differ substantially from the EU space. In 2008, GDP per capita -expressed in PPS- in most W. Balkans countries was lower than the half of the EU-27 average. Croatia has the higher rate (63, EU-27=100) while the rates of Turkey and FYROM were clearly lower (47 and 34, respectively). For the other CC/PCC we can use only GDP per capita in Euros -which is less appropriate for comparisons among countries. Compared to the value for FYROM which amounted in 2008 to 3.300 Euros per capita, the respective values for Montenegro and Serbia were higher: 4.720 and 4.220, respectively, while the value for the Bosnia and Herzegovina was lower -3.192- and those for Albania and Kosovo were much lower: 2.661 and 1.791, respectively[6].

The differences of the CC / PCC from the EU-27 countries as for the social and environmental features are also very important. If EU-27 could be divided into "North", "South" and "East" parts with decreasing competitiveness and, in more general, clearly different development patterns, the WB countries come under a fourth pattern with considerably lower level of development compared to the European "East". –see more details on this division in section 5.

S. Maric (2009) stresses that: "apart from geographic proximity, economies belonging to Western Balkan region have something in common – achieving worse economic performances in comparison to the countries of Central and Eastern Europe"[7]. From the same scope, P. Simic characterised the W. Balkans as a ***"European third world"***[8].

From 2000 to 2008, all the Western Balkans countries showed an impressive economic growth with annual real GDP growth rates between five and ten percent (Wunsch - Rappold 2010). "With some delay, the economic and financial crisis reached these states. The year 2009 marked a particularly strong reversal of the previous tendency. Croatia and Serbia, the largest economies in the region, showed a clear economic downturn of -5.8 percent and -3.0 percent respectively. Bosnia and Herzegovina (-3.4%) and Montenegro (-5.3%) were also hit strongly by the economic crisis" (ibid).

"The integration of the Western Balkans' financial sector into the global financial markets is limited, so that the immediate consequences of the financial crisis were hardly

[6] Elaboration of Eurostat data by NTUA team

[7] Manic (2009) has also pointed out the lack of economic cohesiveness among the WB countries "represented by unenviable level of intra-regional trade seemed to be natural consequence of objective as well as subjective factors", as among others, the low level of cooperation among these countries.

[8] See in LIEIS 2005 (with reference to the contribution of P. Simic): "what tends to be forgotten or neglected in the West at large is the 'Third Europe' (tiers Europe), a 'European third world', beyond the periphery, which is euphemistically termed "South-East Europe" ".

felt in the region. However, by 2009 at the latest, the dramatic economic recession in the EU as the region's most important trade partner had a significant impact upon the small, mostly very open economies of the region…. [9] Since the economies in the region start from a low base level, a visible deterioration of the financial situation of the population and an increase in unemployment are highly likely. In 2009, the unemployment rate in FYROM reached 32.2 percent, in Bosnia and Herzegovina it climbed to 42.7 percent" (ibid).

The evidence and the conclusions on these issues which are included in the 5th Cohesion Report (EC 2010) as well as the results of our analysis of the respective indicators (see in next) corroborate the previous estimations.

Wunsch - Rappold 2010 has also stressed the need to limit existing structural differences in the WB "such as inflexible job markets, a lack of competitiveness, and insufficient infrastructure" as well as to change the prevalent growth model, which was excessively dependent on foreign capital, foreign trade and an increasing foreign debt. Further on, they have pointed out the necessity to develop and implement rapidly "a regional strategy for economic recovery and development, inspired by the "Europe 2020" strategy". The improvement of the regional cooperation and coordination could ensure the compatibility of the new strategy with existing national approaches.

According to the 5th Cohesion Report, the economy of **Turkey "**is a complex mix of modern industry, commerce and a traditional agricultural sector that still accounts for around 25% of employment. There is a strong and rapidly growing private sector and, while it remains a major participant in basic industry, banking, transport, and communications, the role of the State has been diminishing as the privatisation programme proceeds. The largest industrial sector, textiles and clothing, which accounts for a third of industrial employment, faces stiff competition in international markets…"

Real ***GDP growth has frequently exceeded 6% a year***, but has been interrupted by sharp declines in output in 1994, 1999 and 2001. Growth was particularly strong between 2002 and 2007 largely due to inward investment and IMF backing. GDP, however, declined in 2008 and 2009 as a result of the global recession"[10]. ***GDP per head in Turkey in PPS terms was less than half the EU average in 2006*.** Moreover, regional disparities in GDP per head are relatively wide, with the level well above the national average in regions in the West and well below in those in the East. The Istanbul region, which accounts for 20% of the total population (70 million), had a GDP per head in 2006 which was 70% above the national average, whereas in Van, on the Iranian border, it was almost 70% below the average. Between 1995 and 2005, GDP per head tended to increase by more in the regions with the lowest levels.

[9] "Spillover effects triggered by the global economic downturn have become particularly manifest through decreasing exports and a lack of foreign direct investment. The decreasing demand for products originating from the Western Balkans has lead to a lower production level and a decrease in tax income" (ibid).

[10] "Despite the large current account deficit and substantial foreign debts, further economic and judicial reforms and prospective EU membership are expected to boosting foreign direct investment in the future" (ibid).

4.2. Analyses at country (NUTS0) and macro (overall CC/ PCC) levels per TC dimension

The previous "general overview" gave us first ideas / hypotheses on the development of the CC/ PCC based on the respective literature and on a limited number of indicators at country level (comparison among the countries) and at macro level (overall CC/PCC) in comparison with the EU-27. We advance here to an **analysis at macro and country (NUTS0) levels** using a much wider range of data / indicators at these levels which are available in Eurostat.

We present the respective results **per TC dimension.**

The TPG has defined several **"dimensions" of TC** –see in the Interim Report. In the same Report's "white paper" (Annex 5 of the Report) on the selection of indicators on the basis of the territorial challenges and EU policy priorities have been defined *seven Territorial Cohesion's (TC) major Issues* **corresponding more or less to "dimensions" of TC** – see in the following Table.

Dimensions of TC	**TC major Issues**
Competitiveness	• Smart, competitive development
Innovation	
Inclusion	• Inclusive development
Environment quality	• Environment sustainability and climate change
Energy	• Sustainable energy
Territorial structure	• Local development and rural areas
Connection	• Sustainable mobility and connectivity
Cooperation / governance	• Territorial governance, coordination of policies and territorial impacts

We also discuss **per TC dimension** the **specific** territorial challenges and policy priorities which are related to specific priority themes as, for example, the level of education, innovation, climate change, risk / hazards etc.

At the beginning of each sub-section, we remind the more important issues at stake for each section (see in the Interim Report, specifically in the Annex: "white paper" of the Report).

Our estimations which are presented in next take out the more important (from the point of view of INTERCO) estimations of the "Pocketbook" (2010) for the different TC issues at stake.

These estimations are based on the respective Eurostat data at NUTS0 level. These data correspond to the majority of INTERCO "headline" indicators, to a large number of INTERCO "core" indicators and to a relatively limited number of INTERCO "final" indicators.

We give in next per TC dimension, the lists of indicators used (at NUTS0 level) by the "Pocketbook" and their correspondence to INTERCO type of indicators

Competitiveness[11]

INTERCO Priority themes

- Economic performance: GDP Growth, Income, Trade, Investment, Inflation and Interest rates, Labour productivity, Mobility, Employment, Wages
- R&D and innovation performance
- Human capital
- EU enlargement (it could be studied using the rest of themes and indicators)

Indicators used by the "Pocketbook"	**INTERCO type**
GDP growth rates	Final / Headline
the share of final consumption expenditure in GDP	Headline
trade deficit	
proportion of total value added from the agriculture, forestry and fishing sector	
growth of the service sector	
industry sector	other
total number of persons employed	
labour productivity	Final / core
inward FDI flow	
Employment and activity rates	Final / headline (employment rate)
Employment and activity rates by gender	Final / Headline
economic activity rates of men	Final
employment rates for older workers	Headline
employment rate for older women	Headline
level of employment	
Number of persons employed and employment by sector	5th Cohesion Report
unemployment rates	Final / Headline
unemployment rate for women	Final / Headline

- Economic performance

Since 2002, all the CC/ PCC[12] have recorded sustained GDP growth in constant prices. More, **their GDP growth rates from 2003 were higher than that in the EU-27**. However, in most countries, there were substantial variations around the rising trend. For most countries where 2008 data are available, growth rates fell dramatically from 2007 to 2008.

Over the period 2000 to 2008, all CC/PCC, apart from Serbia (18%), recorded a higher percentage growth in GDP per head than that of the EU-27 at 31.4%[13].

The **proportion of GDP accounted for by final consumption expenditure** in the EU-27 was stable, at a little fewer than 80%, during the period 1998 to 2008. By and large, **the share of final consumption expenditure in GDP was higher in CC/ PCC than in the EU-27** and, in many cases, substantially so[14].

[11] It corresponds to the major TC Issue: "Smart, competitive development" – see previously

[12] for which data are available

[13] Croatia, Bosnia and Herzegovina and Montenegro (2000 to 2007) more than doubled their GDP per capita over the period observed.

[14] Exceptions to this rule were Croatia with a continuing decrease since 2002, ending slightly below the EU-27 level in 2008.

During the period 2000 to 2008, **each of the CC/ PCC reported a trade deficit every year. This was in contrast to the surplus for goods and services recorded by the EU-27** (including intra-EU-27 trade) in each year.

Compared to the EU-27[15], the economies of **the CC/ PCC generated a considerably higher proportion of total value added from the agriculture, forestry and fishing sector**

The growth of the **service sector** between 2000 and 2007 was particularly pronounced in Serbia, Montenegro and Turkey. The rise in the service sector in all other countries, ranging from 1.3 to 3.5 percentage points, was broadly similar to the EU-27 figure of 2.0.

The **industry sector decreased in EU-27 and CC/PCC**, except Albania and Bosnia and Herzegovina. The share of the construction sector was generally stable or growing relatively moderately over the period 2000 to 2008. The only exceptions were Montenegro, Turkey and Bosnia and Herzegovina.

The total number of persons employed in the EU-27 rose every year over the period 2002 to 2008. None of the CC/ PCC reported such sustained increases over the same period.
Compared with the **EU-27, where there was a sustained and relatively stable increase in labour productivity** at between 0.9 and 2.2 per cent, **none of the CC/ PCC recorded positive changes over the entire of the period observed.**

Foreign direct investment (FDI)[16]
The EU-27 was a net investor abroad in 2008. **In contrast, inward FDI flows (investments by foreigners) were much greater than outward FDI flows (investments abroad) for all of the CC/ PCC in 2008**.
Despite relatively sharp falls in inward flows of FDI to the majority of the CC/ PCC between 2007 and 2008, the longer-term trend (since 2000) of inward flows of FDI was strongly upward.

For example, although inward FDI flows to Turkey declined by EUR 3.8 billion between 2007 and 2008, they remained EUR 11.3 billion higher than in 2000. In contrast to the other CC/ PCC, outward FDI flows for Iceland were much greater than inward FDI flows for the nine years through to 2008. Outward FDI flows accelerated between 2003 (EUR 336 million) and 2007 (EUR 7.7 billion).

FDI intensity is the average of inward and outward FDI flows divided by GDP. It is an indicator (albeit sometimes volatile for developing countries) of integration with the international economy[17]. Among the CC/ PCC for which data are available, the highest level of FDI intensity in 2008 was recorded for Serbia (average FDI flows corresponding to 6.0% of GDP), although this was down sharply on the ratio recorded in 2001. **Only Croatia also had FDI intensity ratio** (3.6%) in 2008 **above that of the EU-2**7 (3.4%), in both cases this being higher than the respective ratios for 2000. The FDI intensity ratio for Albania fell back to 3.2% in 2008, below that of the EU-27. Arguably, the most volatility was recorded for Kosovo, where the FDI intensity ratio fell back from about 2.6% in 2005 to 0.1% in 2008, which might in large part reflect the scaling back of investment flows after the initial, post conflict, surge.

- Labour force, employment

Employment and activity rates (Final / headline indicator and 5th CR)

[15] which recorded a value of under 2% in 2008
[16] Inward foreign direct investment (FDI) is investment made by foreign entities in enterprises resident in the reporting economy. Outward FDI (or FDI abroad) is investment by entities resident in the reporting economy in an enterprise abroad. Both inward and outward FDI are the net result of investment and disinvestment. The sign convention adopted for both inward and outward FDI flows is that investment is always recorded with a positive sign and a disinvestment with a negative sign. It should be borne in mind that FDI flows can fluctuate significantly from one year to another, particularly when there are changes in the economic climate.
[17] An increase in FDI intensity relative to GDP implies that the national economy has been further integrated into international markets through higher investments by foreign investors in the national economy and/or national investors increasing their investments abroad.

The employment rate among the EU-27's population aged between15 and 64 years rose relatively steadily in the ten years through to 2008, from 61.2% to 65.9%. All CC/ PCC registered lower employment rates in 2008 than the average rate for the EU-27[18].
The proportion of the EU-27's population aged between15 and 64 years old that was **economically active** in **2008 was higher than in all CC/ PCC**. For the EU-27 as a whole, as well as the majority of the CC/ PCC, the economic activity rate in 2008 was higher than that recorded for 2000[19].

Employment and activity rates by gender (Final / headline indicator)

Across the EU-27 as a whole and among all the CC/ PCC, the economic activity rates of men were notably higher than those of women. This characteristic was most notable in Turkey and Kosovo.
These differences were also reflected in the employment rates for men and women. The gap between the employment rates of women and men in the EU-27 narrowed, from 18.3 percentage points in 1998 to 13.7 percentage points in 2008. The employment gender gaps in Croatia, Montenegro and Albania were relatively similar to that for the EU-27. The employment gender gap in Serbia was a little wider than the EU-27 average, the gaps in Bosnia and Herzegovina, Kosovo and, particularly, Turkey being much wider still.

The employment rate for older workers (aged 55-64) across the EU-27 as a whole rose to 45.6% in 2008, much higher than the corresponding rate (36.2%) ten years earlier but still beneath the target rate of 50% set for 2010. The employment rate for older workers in Albania that was recorded for 2007 (46.6%) was slightly higher than the EU-27 average. **The employment rates for older workers in other CC/ PCC were much lower than the EU-27 average** (except from Albania)**.**

Nevertheless, rates rose relatively steadily from low levels in FYROM, in Kosovo and particularly in Croatia. In contrast, the employment rates for older workers in Serbia (at least through until 2006) and particularly in Turkey declined relatively sharply, in part reflecting the broader decline in the employment rate for the total population aged 15 to 64 years old.

As with the total labour force, **the employment rate for older women was lower than that of older men in the EU-27 and among all of the CC/ PCC**.

The gender employment gap among older workers in the EU-27 was 18.1 percentage points in 2008, which was greater than the 13.7 percentage point gap among the total labour force. The relatively wider gender employment gap among older workers was a feature in all of the countries. The widest gap among older workers was recorded in Kosovo (34.0 percentage points in 2007).

Number of persons employed and employment by sector (5th CR indicator)
The **level of employment** in the EU-27 grew by 1.2% per year between 2000 and 2008. Among the CC/ PCC, **only Montenegro recorded stronger rates of growth** over the longer-term. Aside from Turkey and Serbia, **longer-term growth in the level of total employment in the other CC/PCC was much lower than that for the EU-27.**
Differences between the economies of the EU-27 as a whole and the CC/ PCC can be shown according to the **distribution of employment between different economic sectors**.

Persons in services accounted for almost one half (49%) of total employment in the EU-27 in 2008. With the notable exception of Albania, the services sectors in the other CC/ PCC were either of a similar relative size or, as in the cases of Kosovo and Montenegro much larger. In contrast, employment in agriculture, forestry and fishing activities accounted for about one in every two persons in employment in Albania in 2007, nearly seven times the equivalent share for the EU-27 as whole. There were also relatively high shares of employment in agriculture in Turkey and Serbia.

Unemployment rates (Final / headline indicator and 5th CR indicator)

The average rate of unemployment across the EU-27 as a whole was 7.0% in 2008[20]

[18] ranging from 26.2% (2007) in Kosovo to 57.8% in Croatia
[19] Declines over this period were recorded, however, in Turkey, Serbia and, in particular, Montenegro.
[20] which represented a marked turnabout from the 9.2% recorded in 2004

The unemployment rate for women (7.5%) in the EU-27 was higher than that for men (6.6%) in 2008, and this characteristic was also common to the CC/ PCC.

Long-term and youth unemployment rates (5th CR)
The long-term unemployment rate across the EU-27 as a whole was 2.6% in 2008. **In all of the CC/ PCC[21] the latest annual long-term unemployment rate was higher than the EU-27 average for 2008**.
As with the overall unemployment rate, the highest long-term unemployment rates were in Bosnia and Herzegovina (2007), FYROM and Kosovo.
Across the EU-27 as a whole, the youth unemployment rate was 15.5% in 2008. Youth unemployment rates for 2008 were higher than that of EU-27 in FYROM (56.4%) and particularly Kosovo, Bosnia and Herzegovina and Serbia despite sharp falls since 2006. Only in Turkey and Albania (2007) were youth unemployment rates relatively close to the level for the EU-27.

Innovation[22]

Indicators used by the "Pocketbook"	INTERCO type
Gross domestic expenditure on research and development GERD	core
R&D expenditure	
R&D intensity	

The main measure used for research and development (R&D) statistics is **gross domestic expenditure on research and development** -often referred to as **GERD**-. Expenditure on R&D is composed of expenditure by business enterprises, higher education institutions, government and private non-profit organisations. Such expenditure data relates to research expenditure on national territory, regardless of the source of funds; **data are usually presented relative to GDP as R&D intensity.**
Research and development (R&D) lies at the heart of the EU's Lisbon strategy to become the most competitive and dynamic knowledge-based economy by 2010. Indeed, **one of the goals set in Lisbon was for EU R&D expenditure to increase to at least 3.0% of GDP by 2010**.
In 2007, the EU-27 GERD accounted for a 1.85% share of GDP, below the 3.0% goal.
For the CC/PCC where data were available for 2007, **Croatia, FYROM and Turkey recorded significantly lower R&D intensities than the EU-27.** They ranged between 0.18% in FYROM and 0.81% in Croatia.
In line with the EU-27, **R&D intensity has risen in Turkey and Montenegro** over the period shown, although no country has shown a consistent year-to-year increase. In contrast, **Croatia and FYROM recorded decreases in their R&D intensities but with year-to-year fluctuations.**

Inclusion[23]

INTERCO Priority themes
• Demographic changes and imbalances: population and workforce ageing, in-out migration, labour market segmentation
• Social tensions and disparities
• Downgrading and insufficient use of cultural assets for development

[21] for which data are available (Montenegro excluded),
[22] It corresponds to the major TC Issue: "Smart, competitive development"
[23] It corresponds to the major TC Issue: "Inclusive development"

Indicators used by the "Pocketbook"	INTERCO type
Population and population growth	Headline / 5th Cohesion Rep.
Population ageing	Final
Population structure by gender and age group	
Crude birth, death and natural increase rates	5th Cohesion Rep.
Life expectancy	Headline / 5th Cohesion Rep.
Early school leavers	Core / 5th Cohesion Rep.
Completion of upper secondary education	
Tertiary graduates in science and technology	Headline / 5th Cohesion Rep.
Expenditure in education and participation in training	5th Cohesion Rep.
Wages and salaries	
Income inequality	Final
Social inequality	Headline / 5th Cohesion Rep.
Household consumption expenditure and social expenditure	

Population and population growth (headline ind. and 5th CR)

As far as population growth is concerned, **most of the studied countries have recorded increases of population,** with the highest numbers presented in Kosovo (8.5%) as well as Bosnia and Herzegovina (8.3%). **The exceptions were Serbia and Croatia**.

Population ageing (Final indicator)

In 2008, **the working age population (15-64 years) accounted for more than two-thirds of the total population in the EU-27 and in all CC/ PCC.**

Between 2000 and 2008 **the share of those over 65 years of age rose in all territories where it remained stable and the EU-27** and Croatia where there were small declines. The only country with a small decline in the working age population (between 15 and 64) was Serbia with a reduction of 0.1 percentage points.

Over the same period, but for different reference periods for the individual countries, **a decrease of the share of those under the age of 15 years can be seen in all territories** for which data are available.

Population structure by gender

In the EU-27 (51.2%), Croatia (51.8%) and Bosnia and Herzegovina (51.0%), the share of women in the population exceeded 50%. The other CC/ PCC all had a small majority of men, with Serbia recording the lowest female share of 48.6%.

Crude birth, death and natural increase rates (5th CR)

For the latest year for which comparable data are available**, Croatia, Albania, Bosnia and Herzegovina and Serbia showed lower crude birth rates than the EU-27**, while FYROM, Turkey, Montenegro, and Kosovo recorded higher rates.

In 2008, the EU-27 **crude death rate** was 9.7 deaths per thousand inhabitants. For the latest year for which comparable data are available, **six out of the eight countries showed death rates below the EU-27 value**. Over a longer period Serbia and Croatia were the only countries showing crude death rates higher than crude birth rates.

Life expectancy (headline ind. and 5th CR ind.)

Life expectancy (LE) at birth in all CC/ PCC for 2008 is lower than in the EU-27 average in total and for both sexes.

- Education

Early school leavers (5th CR)
While the number of early school leavers in the EU-27 has been reduced in 2007, there remained 15.2% of young persons aged between 18 and 24 who had not completed upper secondary education and who were not engaged in any education or training.
Within the CC/ PCC for which information is available, Turkey and the Former Yugoslav Republic of Macedonia had the highest shares for this group. While **the figures show a clear downward trend, there were year-to-year rises in Croatia, Turkey, and Serbia.**

Completion of upper secondary education
In 2008 **more than three quarters of the population aged 20 to 24 had completed at least upper secondary education in the EU-27**. **This was also the case for Croatia and Serbia. In contrast, the proportion in Turkey was around 49% in 2007**, the lowest percentage among all countries reporting.
All countries reporting have registered an increase in these percentages over time. Between 2000 and 2008 there was an increase in the number of students attending the first and second stages of tertiary education in the EU-27 as well as in CC/ PCC for which data is available.

Tertiary graduates in science and technology (headline ind. and 5th CR)
Enrolment rates in science and technology at tertiary level for women are nearly half the men's rate in the EU-27 (2007 data), and slightly above 40% in Turkey (2005 data). In the other CC/ PCC for which data are available, the female participation rate is never less than half that of the male rate. The male rate of the EU-27 (17.9% in 2007) is significantly higher than in the CC/ PCC.
Comparing the first and the last year for which data are available, enrolment rates for both men and women increased in all regions, with substantial rises in many CC/ PCC.

Expenditure in education and participation in training (5th CR)
In 2006 EU-27 public sector investment in education was equal to 5.1% of GDP. **In all CC/ PCC for which information is available, it was smaller than in the EU-27.**
In 2008, **the proportion of the population aged 25 to 64 participating in education and training in all CC/PCC were at least three times smaller than in EU-27**. However, the proportions in each available country, except Serbia, have increased in the period observed.

- Social indicators

Wages and salaries
Nominal wages and salaries increased steadily in the EU-27 and all CC/ PCC, except Serbia, for the years for which data are available. Compared to a modest increase for the EU-27, nominal wages and salaries more than tripled in Serbia and Montenegro and almost doubled in Croatia as well as in Bosnia and Herzegovina.

The inequality of income distribution (Final indicator)
The measure of income inequality in the EU-27 averaged 5 in 2007. This means that the income of the wealthiest quintile was 5 times greater than that of the poorest. **Income inequality increased everywhere except Turkey, where it fell but still to a level well above the EU-27 figure.**

Social inequality (headline and 5th CR)
Comparing 2000 data for both, children and adults living in jobless households, with the latest available year, the EU-27 and Croatia showed a decrease and Serbia recorded an increase. In FYROM, the value for children remained stable while the value for adults showed a small rise.

Household consumption expenditure and social expenditure
As far as health and social protection expenditure as a proportion of GDP is concerned, it stood at 17.8% in the EU-27, slightly higher than the Croatian expenditure ratio of 16.5% or the Serbian expenditure ratio of 15.0%.

On the other hand, health expenditure including the element financed by government, ranged between 2.0%in Montenegro and 7.6% in Turkey. Except Albania and Montenegro the figure was relatively close to the EU-27 value of 7.4%.

Environment quality[24]

Indicators used by the "Pocketbook"	INTERCO type
Municipal waste collected	
Greenhouse gas emissions	core

Municipal waste collected[25]
The **quantity of municipal waste collected per inhabitant in the EU-27 was slightly over 500 kg per person** in 2007. **Montenegro recorded higher figures for waste collected than the EU-27**, reaching almost 1 200 kg per person. **All the other CC/PCC achieved quantities lower than in the EU-27, particularly Albania and Serbia** with figures less than half the EU-27 level. Comparing the years 2000 and the latest available year, quantities collected per person were relatively stable in the EU-27, Turkey and Albania while they increased in Croatia and Montenegro. The only country to record a fall was Serbia.

Greenhouse gas emissions
The Kyoto Protocol set a **target for the EU to reduce climate changing greenhouse gas emissions by 8% between 1990 and 2008 to 2012**.
During the period 1998 to 2007 the EU-27 emissions fell, while emissions in the two countries, for which data are available (Croatia and Turkey), increased significantly. Turkey recorded the fastest rate of growth in greenhouse gas emissions.
Looking at the development **over the entire period, emissions in the EU-27 fluctuated slightly and reached a low point in 2007**. In Turkey, the level of emissions increased significantly up to 2000 but decreased in 2001. From 2002, the growth in Turkey regained momentum and grew steadily up to 2007 when it was more than twice the 1990 base year level. In Croatia emissions showed continuing growth throughout the period 1998 to 2007, except for a slight reduction in 2000 and 2004.

Energy

Indicators used by the "Pocketbook"	INTERCO type
Energy intensity, electricity generation and renewable energy*	core
* INTERCO indicator: Energy intensity of the economy	
The share of renewable energy in electricity consumption	core
* INTERCO indicator: Renewable energy consumption	
Primary production of energy	
Energy supply and consumption	
Breakdown of final energy consumption	

[24] It corresponds to the major TC Issue: "Environment sustainability and climate change".
[25] Municipal waste can be recorded according to different concepts as waste collected and generated. Municipal waste collected does not include waste generated in areas not covered by a collection system. This publication presents data on waste collected, because most countries could not estimate the amount of waste generated in the areas not covered by a collection system.

Energy intensity, electricity generation and renewable energy

The energy intensity of an economy is defined as the **ratio of gross inland energy consumption in kg of oil equivalent per EUR 1.000 of GDP** (kgoe/1.000 EUR) at constant prices (reference year 2000): **the lower the figure, the higher the energy efficiency.**

In 2006, the figure for the EU-27 was little over 200 kg of oil equivalent. All CC / PCC for which data are available recorded higher values (lower efficiency) than the EU-27. In 2007, they ranged from 282 kgoe/1 000 EUR in Turkey to around 660 kgoe/1 000 EUR in FYROM and Serbia.

Over the period observed, energy intensity has shown a downward trend in the EU-27 (-1.5% on average per year) **and all CC/PCC except Serbia. The decreases were moderate in the three candidate countries. This reflects the importance of energy intensive industries in their recent strong economic growth**.

Albania showed a larger fall with 5.5%. Montenegro and Serbia recorded the highest negative and positive growths respectively, but over a very short run of years. **Except for Turkey and Serbia, the gap in energy efficiency between the EU-27 and the CC / PCC has narrowed over the years available.**

Since 1998, electricity production in the EU-27 has been growing by 1.6% per year. Average annual growth in Turkey and Kosovo with about 6% each was much higher than in EU-27. In contrast, there was an annual average decline in Albania, FYROM and Serbia.

The *share of renewable energy in electricity consumption* measures the contribution of electricity from renewable energy sources to total national electricity consumption. This share can vary greatly and depends, to a large extent, on the geographic characteristics of the territory concerned, particularly for geothermal and hydroelectric generation.

Between 2000 and 2007, the proportion of renewable sources in electricity consumption in the EU-27 rose from 12.7% (2000) to 14.0% (2006). With the exception of FYROM in 2007, all countries for which data are available showed higher shares than the EU-27 for the two years compared. Croatia was alone in reporting an increase from 40.0% to 47.0% over the years 2000 to 2007. In contrast, **the two other CC and Serbia recorded a sharp decline in the share of renewable energy sources in electricity** consumption, falling 5.7 percentage points in FYROM, 5.2 in Turkey and 4.2 in Serbia between 2000 and 2007.

Primary production of energy

To allow different types of energy to be aggregated, data on primary energy production: coal, oil, gas, nuclear heat, and hydro-electricity[26], is converted to a common unit, "tonnes of oil equivalent (toe)".

In the period since 1998, primary energy production has been falling in the EU-27 as well as in FYROM, Turkey and Albania. The downward trend averaged 1.1% per year for the EU-27 (1998 to 2007) compared with 2.4% in Albania, 1.6% in FYROM and 0.7% in Turkey over the same period.

In the EU-27, the major source in 2007 was "Other" –including nuclear and renewable sources- which far outweighed coal, natural gas and crude oil. It is calculated as the difference between the primary production of energy and the total of 'crude oil', 'hard coal and lignite' and 'natural gas'.

Hard coal and lignite was the main primary energy source in FYROM, Turkey and Serbia and was the sole source of primary energy recorded in Montenegro, Bosnia and Herzegovina and Kosovo (data available for recent years only). In Croatia, the most important source was natural gas, while crude oil and other products dominated in Albania.

Energy supply and consumption

The energy supply within a country is determined by primary production and by net imports (imports minus exports). Gross inland energy consumption is the amount of energy required to meet the energy needs of the country. It includes coal, oil, gas, nuclear power etc. required as input to electricity generation.

Gross inland consumption = primary production + net imports ± changes in stocks – marine bunkers

In the EU-27 and all CC / PCC, there was a growing reliance on energy imports to meet demand (Table 8.5). About half (55%) of the EU-27's energy consumption in 2007 was accounted for by net imports, compared with about 47% in 1998. In Turkey and Croatia dependency on net imports, was higher than that for the EU-27. In Turkey, net imports accounted for around 75% of the total in 2007,

[26] The energy mix in primary production is determined to a large extent by the natural resource endowment of a territory, strategic policy decisions, with nuclear energy as an example and the development of renewable energy

while Croatia recorded about 57%. Montenegro with 10.8% and Serbia with 19.2% had the smallest share of net imports in total gross inland consumption in the most recent year for which data is available. Regarding the longer-term trends, **Turkey and the EU-27 have been becoming more reliant on imports**. For the other countries, the trend to greater reliance on imports still emerges over the longer run.

The longer-term trends for primary energy production and gross inland energy consumption in the form of average annual growth rates shows no general pattern. There are four different scenarios:

- Decreasing production combined with increasing consumption: EU-27 and FYROM;
- Consumption growing faster than production: Croatia, Turkey and Albania;
- Production growing faster than consumption: Serbia;
- Faster decrease in production than consumption: Montenegro.

Breakdown of final energy consumption

Final use of energy can be broken down by sector (see for detailed definitions in the "Pocketbook"):
(a) The industrial sector (b) The transport sector (c) "Other sectors" which include agriculture, fishing, services, administrative bodies and households.

The structure of final energy demand differed substantially between the EU-27, and the CC / PCC in the latest year for which data is available. These differences reflect divergences in the structure of each country's economy (importance of industry and manufacturing, the rate of motorisation, modes of transport used, energy efficiency, etc.). In the EU-27, industry accounted for little over a quarter of final energy consumption, transport about a third with other sectors and households taking the remaining 40%. Croatia had a very similar distribution of energy consumption between sectors. In contrast, **in FYROM, Turkey, Montenegro, Serbia, and Kosovo, industry's share of total energy consumption was much larger**. Albania is a special case. The share of its energy consumption in transport sector at 42.2% is the highest percentage for all countries.

Between 1998 and 2007, **industry's share in final energy consumption decreased by 1.2% percentage points in the EU-27. The same trend is apparent for Croatia, FYROM, Albania and Montenegro**. On the other hand, **this share grew in Turkey, Serbia and Kosovo**.

In the EU-27 (growth of 2.9 percentage points, 1998 to 2007) **and in all CC / PCC, transport's share of final energy consumption grew** between 0.3 percentage points in FYROM and 7.0 percentage points in Albania.

In the EU-27, households alone accounted for around a quarter of final energy consumption in both 2000 and 2007. All CC/PCC, for which data are available, recorded shares above the EU-27 level in 2000, falling in every case except Montenegro in the last year observed. **The decreases in all countries were larger than in the EU-27**. Despite that fall, Kosovo still shows the highest share of households on total energy consumption of all countries for which data are available.

Territorial structure[27]

Indicators used by the "Pocketbook"	INTERCO type
Utilised agricultural area (UAA)	
Livestock	
Animals for slaughter	
Crop production	

Agriculture

Utilised agricultural area (UAA)[28]

UAA forms one part, along with wooded areas, land occupied by buildings and other land, of the total land area. **Changes in this breakdown indicate the extent to which man has modified**

[27] It corresponds to the major TC Issues: "Local development and rural areas" and "polycentric development and cities".

[28] The utilised agricultural area (UAA) is the total area taken up by arable land, permanent grassland, permanent crops and kitchen gardens used by agricultural holdings, regardless of the type of tenure or whether it is used as common land.

the basic land resource of a territory for agriculture, industry and commercial establishments, human settlements, transport, recreation and other uses.

The use of land for agricultural purposes depends to a large extent on the topography, geology and agro-climatic conditions of a country. For example, mountainous and cold-climate regions will be less suitable for agriculture than flat and more temperate regions. **The utilised agricultural area of the EU-27 was 179 million hectares in 2008, about 15 million hectares less than in 1998.** The reduction in the UAA during this period was largest in Spain, Poland and Italy.

The utilised agricultural area of Turkey was by far the largest among the CC / PCC. **In contrast to the EU-27, the area of utilised agricultural land remained relatively stable in the majority of the CC / PCC during the period between 2000 and 2008.**

In 2008, almost two thirds (about 65%) of Serbia's total land area were used for agriculture. This was the highest share of any of the CC / PCC, and considerably more than the share (about 41%) for the EU-27 as a whole. For the latest years available in the other countries, the utilised agricultural area accounted for between about one quarter of the total land area of Croatia to one half of the total area of Turkey and Kosovo.

The structure of the EU's agricultural sector is extremely diverse, ranging from large, highly intensive farms to subsistence holdings. In the CC / PCC, where traditional working practices are still widespread, subsistence farming is often common. Land abandonment, under-grazing and a lack of capital to maintain agricultural infrastructure are some of the problems faced by farmers in the CC / PCC.

Across the EU-27 as a whole, arable land accounted for about three fifths (59.7%) of UAA in 2008, almost twice the share of permanent grassland (33.3%) and considerably more than the share of land under permanent crops (7.0%). The breakdown of UAA varied considerably among the CC / PCC.

Land under permanent crops showed the lowest percentages of all types of land in all countries reaching values above the EU level only in Montenegro (18.3%), Albania (11.0%) and Turkey (7.5%). Arable land accounted for about two thirds of UAA in both Croatia and Serbia in 2008 but only a quarter (24.1%) of the UAA of Montenegro. Permanent grassland accounted for more than a half of UAA in FYROM (50.9%) and Montenegro (57.6%), but for lower proportions in Croatia and Serbia. However, it accounted for only one fifth (20.8 %) of the UAA of Kosovo in 2001.

Livestock

The livestock population across the EU-27 comprised about 153 million pigs, 88 million head of cattle (of which 24 million were dairy cattle), 91 million sheep and about 1.5 billion poultry. **The number of pigs as well as the number of sheep and goats in the EU-27 was considerably lower in 2008 than a year earlier**, with the number of cattle in 2008 close to the relative low point recorded in 2006.

Among the CC / PCC, Turkey had by far the largest cattle population in 2008, followed by Serbia. Reflecting cultural beliefs and customs, there was relatively limited pig production in most of the CC / PCC.

The dairy herds of the CC / PCC were of much more significance in comparison with the EU-27, accounting for about 50% of cattle in FYROM and Serbia, about 60% in Kosovo and between 65% and 70% in Bosnia and Herzegovina, Albania and Montenegro.

Animals for slaughter[29]

Meat production in the EU-27 dwarfed that of the CC / PCC as a whole.

The differences in the composition of the livestock of the CC / PCC were reflected in the breakdown of meat production. Poultry meat accounted for a little over two thirds (70%) of meat production in Turkey and about one half (45%) of the production in Bosnia and Herzegovina, but only about 8% of meat production in FYROM.

Pig meat accounted for a small majority of meat production in Serbia and Croatia but little or none of the production in those countries where pig meat is not traditional for cultural reasons. Meat from cattle provided almost half of the meat production of Albania. In the ten years up to 2007, the level of meat

[29] The respective information relates to bovine, porcine, equine, ovine and caprine species, as well as poultry

production in the EU-27 remained remarkably stable. Among the few CC / PCC for which such series are available, there were contrasting developments –see more details in the "Pocketbook".

Crop production

The EU-27 cereal harvest (including rice) was 315 million tonnes in 2008, about 55 million tonnes more than the 2007 harvest. The CC / PCC were estimated to have harvested cereals equivalent to about 14% of the total for the EU-27 in 2008. In many of the CC/PCC, cereals production in 2008 rebounded strongly from the relatively poor harvest of 2007.

The sugar sector in EU agriculture is currently going through a period of structural reforms, with a phased renunciation of the sugar quota. This explains some of the sharp decline in the harvested production in 2006 to 110.4 million tonnes. In comparison, Turkey harvested 15.5 million tonnes of sugar beet in 2008, substantially more than any of the other CC / PCC for which data are available. Although this represented something of a rebound from the relative low in 2007, sugar beet production in Turkey remained much smaller than the 22.3 million tonnes harvested in 1998. Of the other countries, only Croatia and Serbia also had any notable sugar beet production, although harvest levels in 2008 were down markedly on those for 2006 and 2007.

Connection[30]

Indicators used by the "Pocketbook"	INTERCO type
Transport infrastructure	
Motorway density in the EU-27	
Inland transport and number of cars	
Freight transport	
Fixed and cellular telephony	
Personal computers and the Internet	
Enterprises and the Information Society	

Transport infrastructure

The EU-27 had 4.8 million km of roads (excluding motorways) in 2004. In 2008, Croatia recorded 28 thousand km and FYROM 14 thousand km. Turkey reported 352 thousand km for the same year.

For the years available[31], the EU-27 and all the CC / PCC, except Serbia, showed a growth of road lengths. For the EU-27, growth averaged around 0.7% per year while in Croatia and Turkey there was very little change (0.3% and 0.2% respectively). Road lengths in Albania grew by more than 7% per year, while Kosovo recorded an annual average rise of almost 11% but from a very low base.

In 2006, the EU-27 had 200 thousand km of railway lines in operation. Turkey had nearly 9 thousand km, Serbia 4 thousand km and Croatia 3 thousand km in 2008.

The length of lines in operation changes relatively slowly. In the period 2000 to 2006, the length of railway lines operating in the EU-27 declined by about one percent per year. Over the longer period from 1998 to 2008, Turkey was the only country recording growth, albeit at a very low rate, while all other countries showed a stable situation.

Motorway density in the EU-27, excluding Greece, Bulgaria and Romania, measured in kilometres per thousand km2 of land area was 11.2 in 2003.

From 2003 to 2008, there was growth in motorway density in all countries for which data are available, with values almost doubling in Croatia and slightly increasing in FYROM and Turkey. Exceptions are Serbia, where the value remained unchanged and Albania, where there are no more motorways in 2008.

Inland transport and number of cars

[30] It corresponds to the major TC Issue: "Sustainable mobility and connectivity".
[31] The period examined is: 2000 to 2008. See details for the years available in the "Pocketbook"

Between 1998 and 2007, the **number of passenger cars** in the EU-27 grew by 1.5% per year. In the CC / PCC very high annual growth rates have been showed in Kosovo (16%) and Albania (11%); all CC/PCC shown a sustained year on year increase except from Serbia and FYROM
The **car ownership per thousand inhabitants** provides a more direct comparison of the degree of motorisation between countries. On this measure, the EU-27 showed an increase of almost 6%. All CC/PCC, except FYROM and Montenegro, showed larger growth than the EU-27.

The highest increases were recorded in Albania at around 144%, Kosovo with about 48% and Turkey with almost 46%. Croatia recorded a 39.2% increase, approaching levels equivalent to those in the EU-27.

In 2008, all countries, except Croatia, had densities (cars / 1.000 inhabitants) less than half the average in the EU-27.

Freight transport

For the EU-27, road freight transport's share in total inland transport has been rising slowly since 2000, reaching about 77% in 2007. **Croatia has levels very similar to the EU-27. Both FYROM and Turkey have much higher levels for road freight transport's share in the total inland market.**

Regarding the allocation of freight transport between modes, **for the EU-27, road is clearly the dominant mode.** In 2008 Turkey recorded the highest value of all CC / PCC, but still less than a tenth of the EU-27 level. Road transport in all other CC/PCC was less than a tenth of Turkey's. A comparison of the first and last year's available for each country shows an **increase in road transport in all except Serbia.** In Serbia, transport by road more than halved from 1998 to 2008 despite a recovery since 2003. Serbia and FYROM were the only countries recording a fall between 2007 and 2008.

Rail is the **second largest transport mode in the EU-27 and most of the CC / PCC**.

In 2006, all countries taken together accounted for less than 1% of the level of rail transport in the EU-27. The EU-27 level has changed little over the four years from 2003 to 2006. In contrast, Bosnia and Herzegovina with an average annual increase of 24.5% (2000 to 2008) and Kosovo with 18.0% (2005 to 2008) showed the largest increases. Despite showing long-term growth trend, Croatia, FYROM, Albania and Serbia recorded decreases between 2007 and 2008.
For modes of transport other than road and rail, only pipeline transport emerged as important in Turkey.

Communication and information society

Fixed and cellular telephony

In the EU-27 there were nearly 234 million land telephone lines installed in 2006. In the same year, the figure for all CC / PCC, for which data were available, was about 26 million lines, around 11% of the EU-27 total.

A comparison of the latest two years for which data were available in each country shows that only three – Croatia, Albania and Serbia – increased the number of fixed lines. All other countries registered a fall.

There were 520 million mobile subscribers in the EU-27 in 2006, while the cumulative sum for the CC / PCC in the same year was a little more than 70 million subscribers, or 13.5% of the EU-27 total.

In the latest two years for which data is available, the total number of mobile subscribers in almost all CC / PCC increased at higher rates than in the EU-27 (10.2%).

The lowest growth was 4.1% in Serbia. Kosovo saw a rise between 2004 and 2008 of over 100%, some compensation for the fall in the number of land telephone lines.

The markets for mobile telephony in the EU-27 and some of the CC / PCC, especially Croatia, FYROM, Montenegro, Serbia has reached saturation, with penetration rates in excess of 100%. This could reflect some subscribers having multiple subscriptions. Rapid growth was still being reported in all countries over the period available. The highest take-up of mobile subscriptions was recorded in Croatia, closely followed by Serbia. These two, together with FYROM, Montenegro had penetration rates above the EU-27 value of 105 subscriptions per 100 inhabitants. The biggest increases were recorded for FYROM and Bosnia and Herzegovina. The respective increase rates were much more important than in the EU-27, where the average value doubled between 2000 and 2006.

Personal computers and the Internet

In the EU-27, 60% of households owned one or more personal computers. Lower ownership figures were recorded for all other countries for which data are available.
The ownership rates are steadily increasing in the EU-27 and countries for which data is available. However, not all of these households have access to the Internet at home, covering all forms of Internet use including e-mail, web browsing, home banking and e-commerce.
The proportion of households with Internet access at home in the CC / PCC was less than half that of the EU-27 (60%) in FYROM, Turkey, Bosnia and Herzegovina and Serbia while it was three quarters of the EU-27 value in Croatia.
The proportion of regular Internet use, which is defined as the use of the Internet on average at least once a week, **was 56% in the EU-27. In Croatia and FYROM, regular Internet use was about two thirds of the EU-27 level.**

Enterprises and the Information Society
For enterprises, there were similar levels of access to the Internet in the EU-27 and the CC/PCC.

93.0% of EU-27 enterprises had access to the Internet, with a higher proportion in Croatia (97.0%) and a similar level in Serbia (91.5%). In both Turkey (89.2%) and FYROM (83.4%) the level was somewhat lower.

However, in no case did all enterprises having Internet access use it for interactions with public authorities. The shares ranged between 56% in Serbia to 69% in Turkey (68% in the EU-27).

4.3. Conclusions on the territorial cohesion at the macro (CC/PCC) and country levels: hypotheses for the lower levels (NUTS3 and beyond) analyses

The literature review on a global approach of Territorial Cohesion (TC) in CC/PCC as well as the specific analyses per TC dimension strengthened the estimations / hypotheses that the respective pattern of TC in these countries differs considerably from that for the EU-27. Specifically, the TC indicators of CC/PCC are in general lines “worse” than the indicators of the EU “Eastern” countries.
These general estimations are based, as we have already pointed out, on data / indicators at country (NUTS-0) on the actual situation and diachronic comparisons.
They refer to the majority of headline indicators of INTERCO, to some of the core indicators and some other INTERCO indicators, which are in many cases used also by the 5th Cohesion Report.
As these estimations have not taken into account data / indicators at sub-national level, they could be at this stage used as improved hypotheses for the lower levels (NUTS3 and beyond) analyses of the section 5.
Therefore it is not worthwhile to explain more here these global estimations. We will further examine these estimations at the sub-national level and we will integrate them in the section 6 on conclusions.

However, it is useful to summarize in the following the conclusions of the section 4.2 **per TC dimensions.** Specifically:

- Regarding *“**Competitiveness”:***

The **GDP growth rates** in these countries from 2003 were much higher than the average rate for the EU-27. However each of the CC/ PCC has a **trade deficit** every year, in contrast to the surplus for the EU-27. The share of **the rural sector in these countries remains much higher** than in the EU-27 (especially in Turkey) while **their service sector records increase rates more important than in the EU-27**. Their industrial sector decreases as in the EU-27.
Inward FDI in CC/PCC increases considerably (with the exception of the period after 2007) but **the FDI intensity ratio** reflecting the level of integration of a country with the international economy **remains much lower than in the EU-27**.

The total number of persons employed increases in these countries less than in the EU-27 and they do not record increases in labour productivity.
The CC/ PCC present **lower rates of active population, employment and activity rate of the older population**. In 2008 the **unemployment rates as well as the long- term and youth unemployment rates for the CC/ PCC were higher** and often much higher than the EU-27 average.

- Regarding ***"Innovation"***

Gross domestic expenditure on research and development (GERD) as a share of GDP **remains in the CC/ PCC much lower than in the EU-27.**

- Regarding ***"inclusion":***

The CC/ PCC reported **increases in population, with the exception of Serbia and Croatia**.
The ageing of population is important in these countries while the **life expectancy is lower than in the EU-27 for both sexes.**
The **shares of tertiary graduates in science and technology** in the population as well as **the public sector investment in education** (as share of the GDP) **are clearly lower** in all CC/ PCC compared to the EU-27 averages.
Income inequality increased in all CC/ PCC except Turkey where it fell but still to a level well above the EU-27 figure.

- Regarding the ***"environment quality"***:

Only for two indicators:
- **Municipal waste collected per inhabitant is much lower in the CC/ PCC**.
- During the period 1998 to 2007 the EU-27 **greenhouse gas emissions** fell, while emissions **in the two countries for which data are available (Croatia and Turkey), increased significantly.**

- Regarding ***"energy":***

In all CC/PCC, energy efficiency is clearly lower than in the EU-27 while the shares of renewable energy are lower in the CC/ PCC compared to the EU-27.

- Regarding ***"connection":***

The CC/ PCC showed a small increase in their rates concerning transport infrastructure and freight, but are still very low in comparison to the EU-27.
In addition, the **proportion of households with internet access in most of the CC/ PCC was less than a half that of the EU-27.**

5. Analysis of territorial cohesion in the CC / PCC on the basis of feasible headline indicators - effectiveness of these indicators

As we have already mentioned, in this section we will analyse TC in the CC/ PCC on the basis of **both national and sub-national level** (NUTS2 / NUTS3 and beyond) data as a major objective of our research is exactly to **see at which extent the TC pattern of the CC/ PCC at the sub-national level differs from the respective pattern at national level.**

As we have mentioned in section 3, we can't examine a great number of TC indicators at sub-national level because the respective data are scarce. We will examine only six indicators:

- Three indicators of "competitiveness": GDP rate, GDP dispersion and unemployment rate.

- Three indicators of "inclusion": ageing index (people aged 65+ / total population), life expectancy and population density,

Therefore, we will not give a complete analysis of TC at this level. Inversely, **we will analyse in more depth these few TC indicators** than in the previous section 4 **in order to see if the additional results bring important insights regarding the TC patterns at national and sub-national (NUTS2 / NUTS3) level as well as on the differences between these two last.**

In more detail:

(a) We will examine several types of statistics of variation at NUTS0 and NUTS2 / NUTS3 levels: min / max, mean (average), standard deviation and coefficient of variation and we will evaluate at which extent these statistics reflect the inequalities regarding TC.

(b) We will use the assumption on the division of the EU-27+CC/CPC space in 4 mega-regions / groups of countries: north, south, east and CC/PCC as a hypothesis to check (further than in the section 4). See in more detail below –in section 5.1.

(c) As one of our objectives is to see if the TC pattern in the CC/PCC differs from that of the EU-27, we will compare per theme / issue the values of TC indicators in the CC/PCC with the **EU-27 average.**

5.1. Competitiveness

GDP rate at country (NUTS-0) level

GDP is of primary importance in order to evaluate if there is a distinctive pattern of the CC/PCC in the frame of the EU-27+CC/PCC area

GDP in the EU countries and HR, TR and MK is expressed either in Euros or in PPS (Purchasing Power Standard). It is preferable to use GDP in PPS because this enables us to compare directly the purchasing powers of the national populations –see below the respective definition. Inversely, the comparison of GDPs in Euros is deformed to some extent.

Definition of GDP per capita in PPS by Eurostat

GDP (gross domestic product) is an indicator of the output of a country or a region. It reflects the total value of all goods and services produced less the value of goods and services used for intermediate consumption in their production. Expressing GDP in PPS (purchasing power standards) eliminates differences in price levels between countries. Calculations on a per inhabitant basis allow for the comparison of economies and regions significantly different in absolute size. GDP per inhabitant in PPS is the key variable for determining the eligibility of NUTS 2 regions in the framework of the European Union's structural policy.

However, as in the case of the CC/PCC there are data on GDP PPS only for HR, MK and TR, we have also used GDP per capita in Euros and GDP per capita in Euros as percentage of EU27 average (=100) in order to cover in addition the rest CC/PCC: AL, BA, ME, RS and XK.
We have also tested GDP per capita in PPS and GDP in PPS per capita in % of the EU-27 average (2006) only for the EU countries and HR, MK and TR.

Regarding the economic performance of the EU-27 countries, there are **two divisions / typologies** which are often used in regional / territorial analysis –see also previously.

(1st) The EU-27 countries are divided in **three major categori**es as for the economic performance per descending order **measured by the GDP per capita: highly developed, moderately developed and less developed.** See for instance the use of this division in the 5th Cohesion Report (2010).

On the basis of the following Graph 5.1.1, it is obvious that in the "less developed" countries are included most of the Eastern EU countries. **Croatia and Turkey are also included in this third category**.

All the other CC/PCC could be included regarding GDP per capita in a 4th category clearly distinguished from the third category. However, in this last group are also included two of the Eastern EU countries: RO and BG.

Inside this fourth group we could discern **3 sub-groups** in descending order of GDP per capita: (a) Montenegro and Serbia, (b) Bosnia & Herzegovina and FYROM and, finally, (c) Albania and Kosovo under UNSCR 1244/99.

In total for the CC/PCC we discern **four groups of countries**: the three latter and the group of HR and TR.

We should stress here that this division / typology does not take into account the territorial dimension, i.e. the inclusion of the countries in groups according to their geography / location which has a territorial meaning.

Therefore, in order to further assess the hypothesis of the existence **of four distinct territorial types / groups of countries** we need to check the degree of inequality inside each of these groups.

Specifically, these four groups contain the following countries:

- "Northern countries" -**EU "north"**-: LU, NO, CH, DK, IE, NL, SE, FI, AT, BE, DE, FR and UK.

- Southern countries" -**EU "south"- :** IT, ES, CY, GR, PT and MT.

- Eastern countries" -**EU "east"- :** SI, CZ, EE, SK, HU, LV, LT, PL, RO and BG.

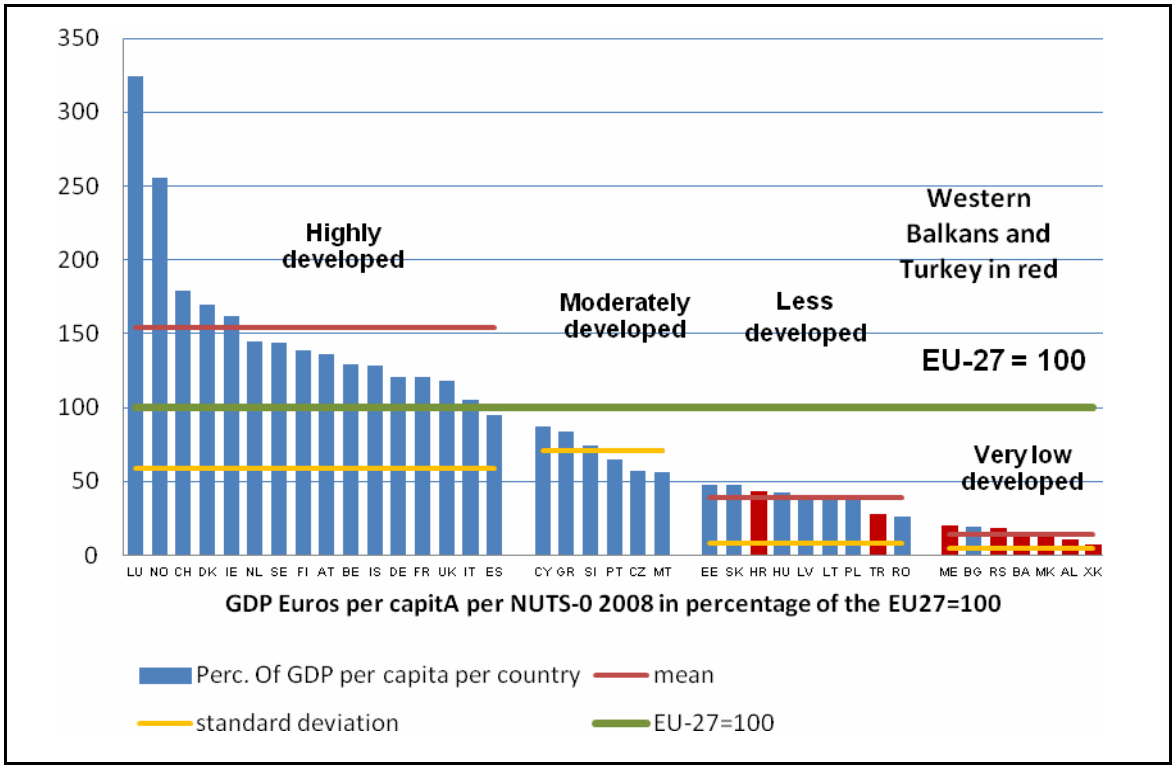
- CC/PCC – WB and Turkey: HR, TR, ME, RS, BA, MK, AL and XK.

The inequalities among the 4 "territorial" groups –see in Graph 5.1.2 and Map 5.1.1- are similar to the previously analysed ones (among the highly, moderately and lowly developed countries) despite the fact that this time HR and TR as well as BG and RO are included in "territorial: groups. The means (averages) corresponding to the "territorial" groups are clearly different.

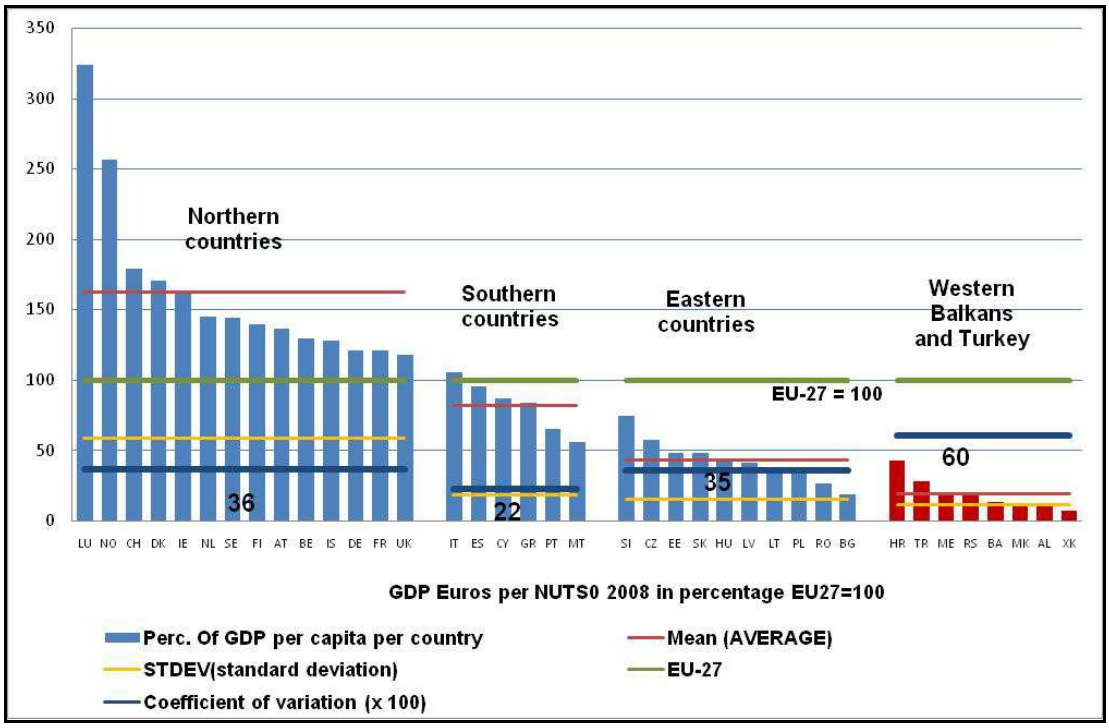
The comparison could be improved using the Standard deviation (stdev) and, even better, using the Coefficient of variation: stdev / mean.

From this scope, the CC/PCC presents the higher degree of inequalities: the respective coeff. of variation amounts in 60, while for the EU "north", the "south" and "east" amount in 36, 22 and 35, respectively – see in the Graph 5.1.2 and the Map 5.1.

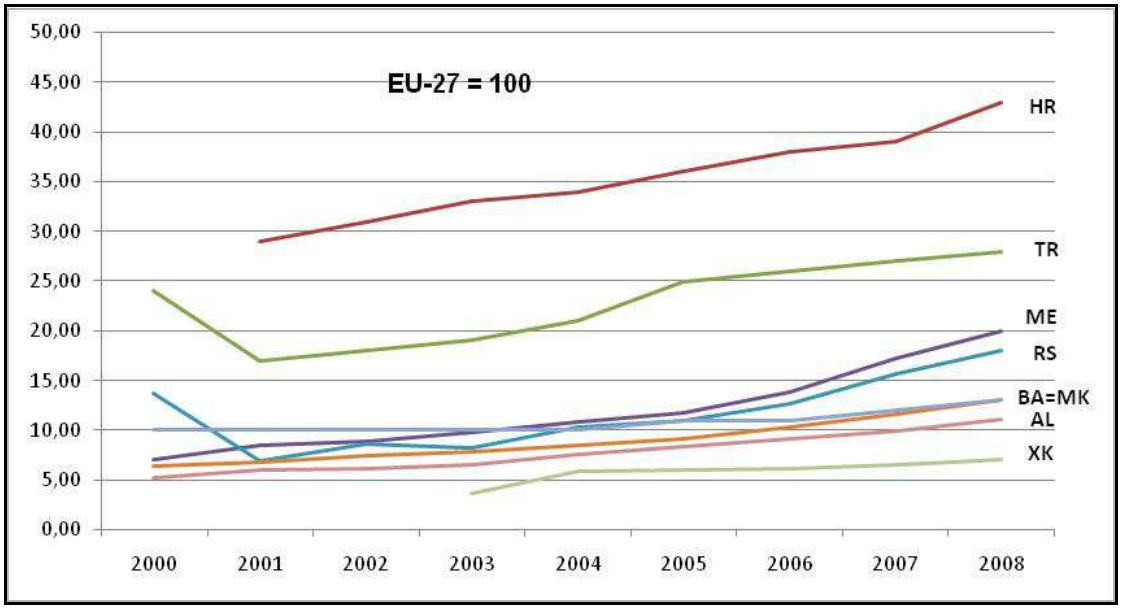
Regarding the differences in GDP rate inside the group of CC/PCC (division in 4 subgroups of countries –see before), it seems that they remain unchanged over time, from 2000 to 2008 –see in the Graph 5.1.3.



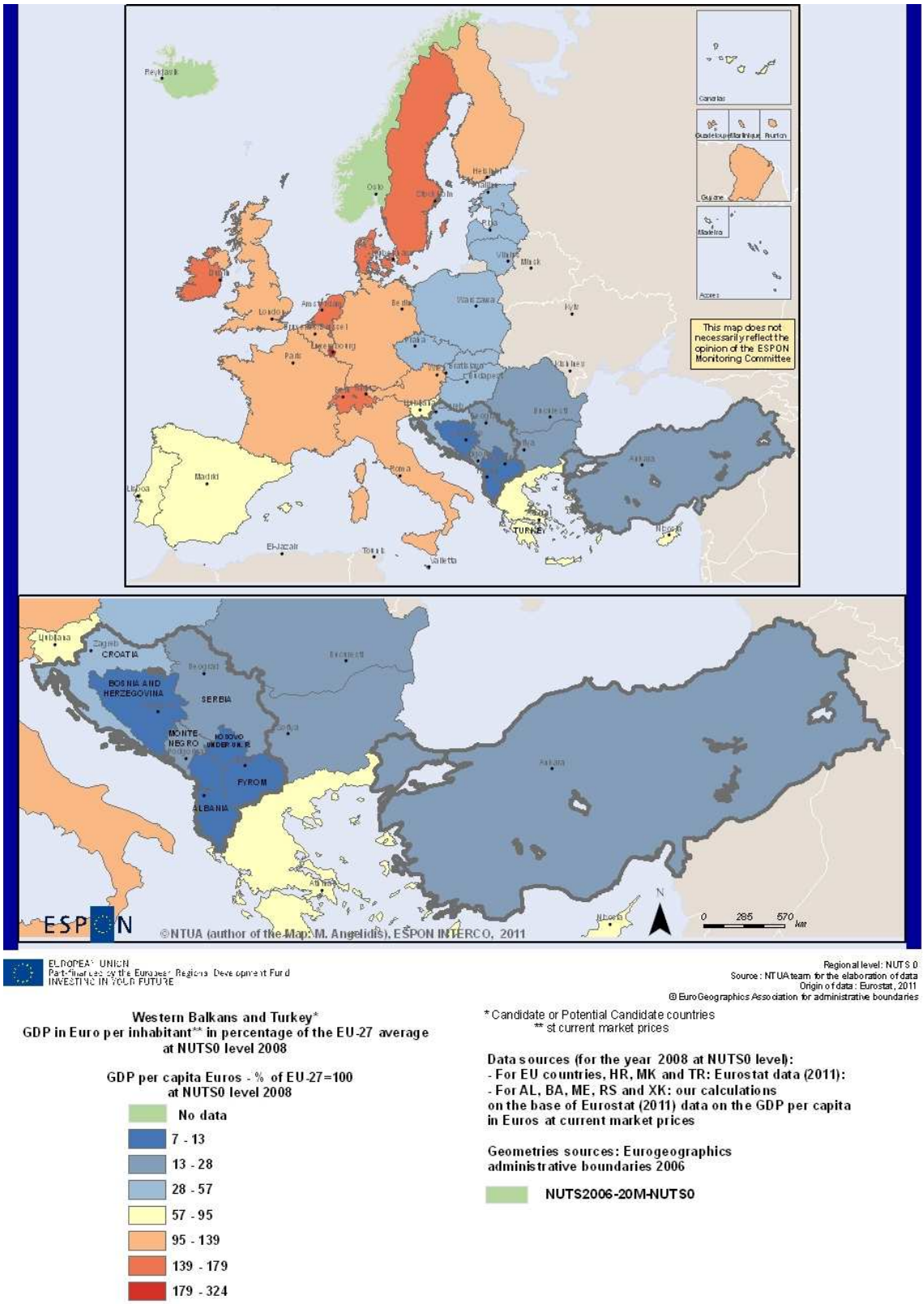
Graph 5.1.1: GDP in Euros per capita at current market prices per EU country (NUTS 0) and CC/PCC in % of the EU-27 average (=100) 2008



Graph 5.1.2: GDP in Euros per capita per EU country (NUTS 0) and CC/PCC in % of the EU-27 average (=100) 2008 – North, South, East, WB and Turkey



Graph 5.1.3: GDP Euro per inhabitant in percentage of the EU-27 average in CC/PCC 2000-2008



Map 5.1.1: EU countries and CC/PCC: GDP per capita in Euros - % of the EU-27 average (=100) at NUTS0 level 2008

GDP rate at sub-national (NUTS-2) level

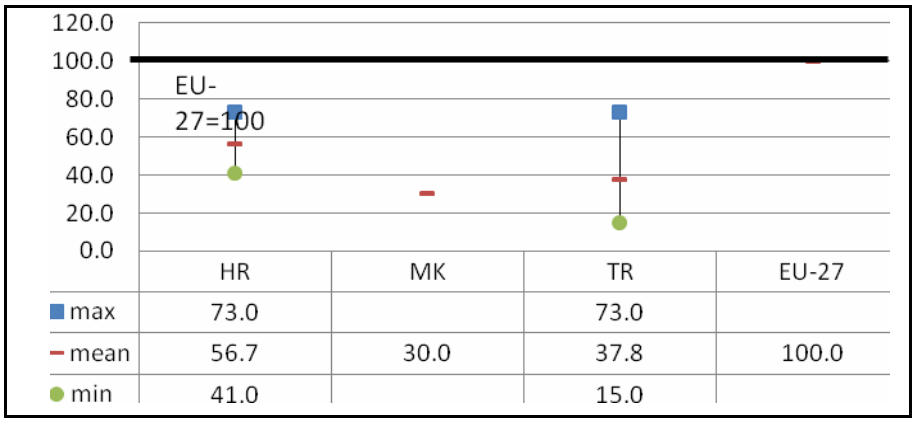
In this case we have data only for HR and TR. We used GDP PPS per capita in percentage of the EU-27 average at NUTS-2 level for the year 2006.

As he have already seen, HR and TR have national average (mean) rates which are clearly lower than the EU-27 average (EU-27=100) – see in the Graph 5.1.4 and the Maps 5.1.2 and 5.1.3 (in GDP Euros and GDP PPS respectively).

Obviously, regional inequalities measured on the base of the coefficients of variation are more pronounced in TR than in HR (44 against 28 –see in Graph 5.1.4). We could hardly compare these values with the value for the overall EU-27 (because this last corresponds to a very important number of countries and regions) which amounts in 38.

We could make a useful comparison with BG and RO which are neighbouring to the CC/PCC. The values of the corresponding coefficients of variation amount in 54 for RO and 43 for BG. Also, the Map 5.1.2 shows that intra-national inequalities in GDP are more pronounced in some countries in all the three parts of EU-27 (north, south and east). It is evident that in most cases differences between the capital cities' regions and the rest are important both in EU-27 and the CC/PCC.

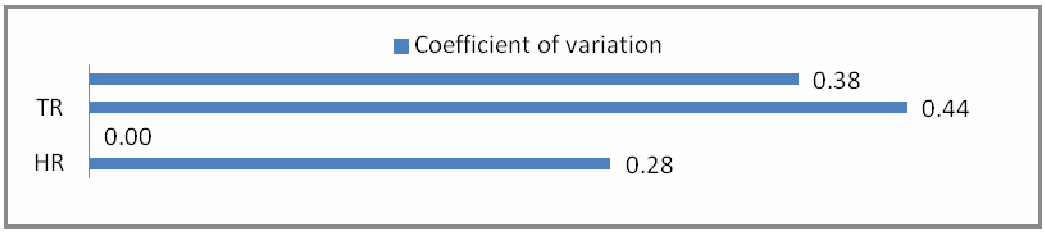
However, it is preferable go in more depth in the comparison of the GDP per capita using the dispersion of GDP –see in next sub-section.



	HR	MK	TR	EU-27
Standard deviation	16,01		16,75	38,41
Coefficient of variation	0,28		0,44	0,38

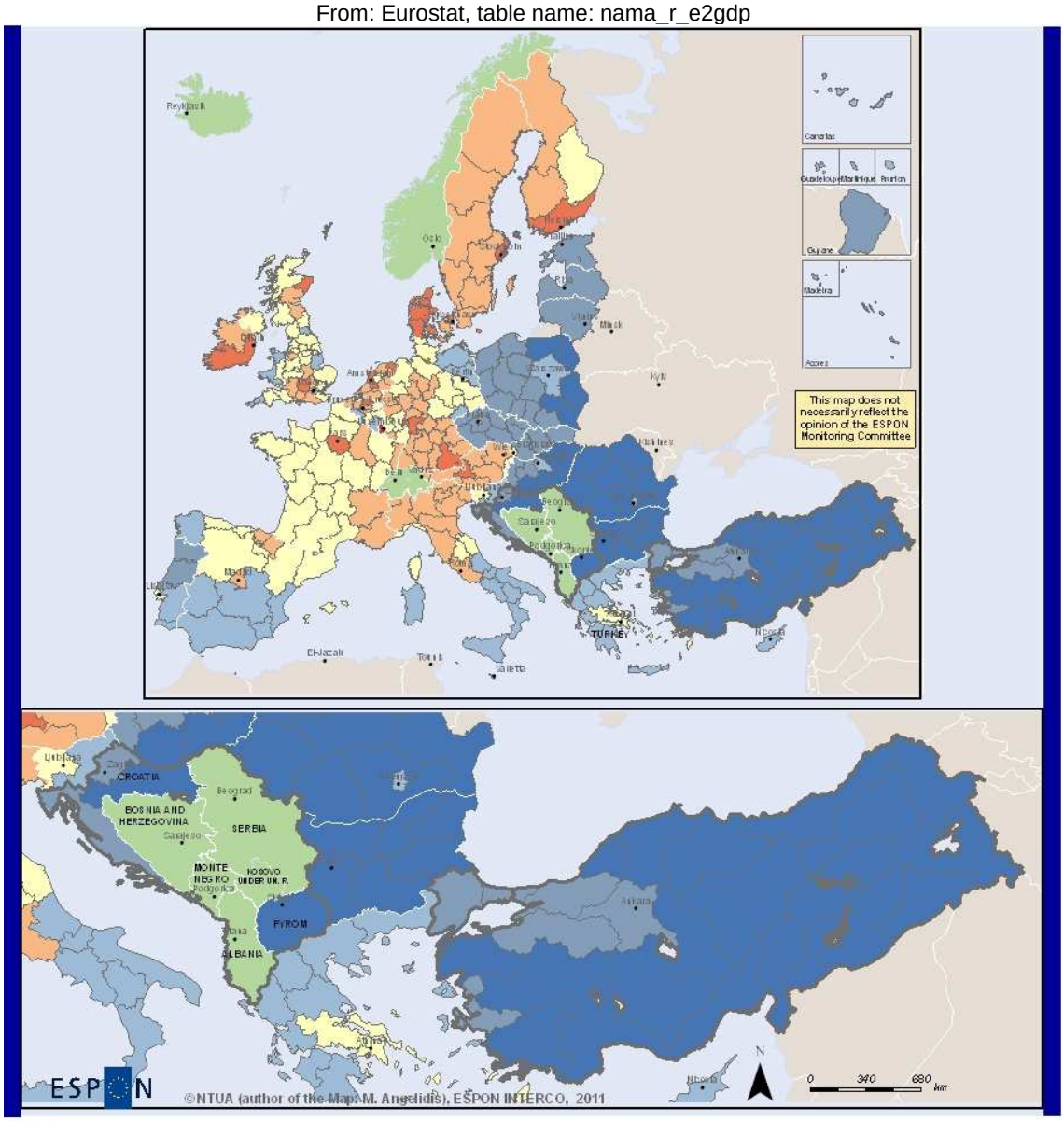
Graph 5.1.4: GDP in PPS per capita in % of the EU-27 average (2006) at NUTS-2 level

From: Eurostat, table name: nama_r_e2gdp

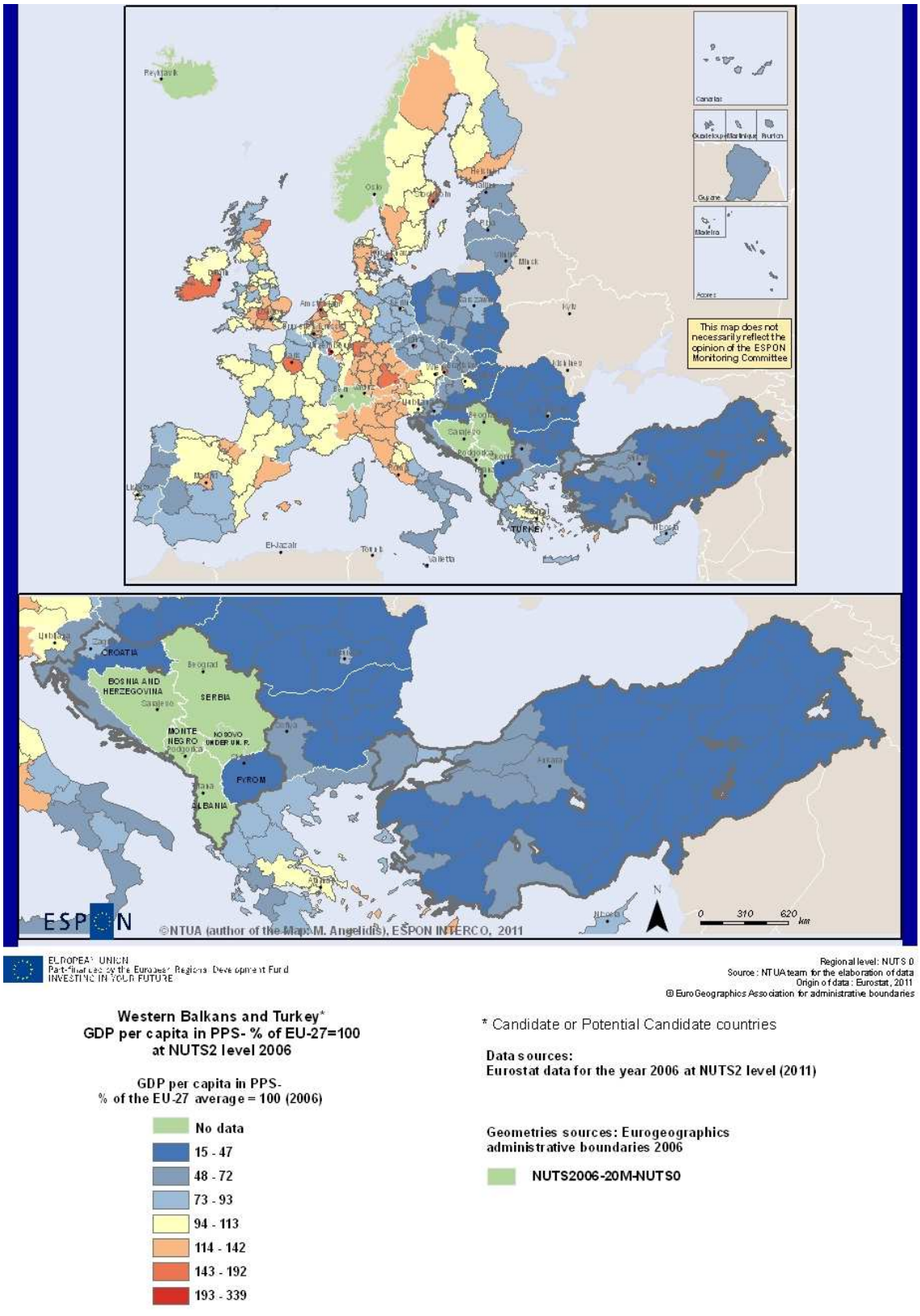


Graph 5.1.5: GDP in PPS per capita in % of the EU-27 average (2006): coefficients of variation measured at NUTS-2 level

From: Eurostat, table name: nama_r_e2gdp



Map 5.1.2: EU countries and CC/PCC: GDP per inhabitant, in Euros – percentage of EU-27 average (=100) at NUTS 2 or similar NUTS 2 level 2008



Map 5.1.3: EU countries and CC/PCC: GDP per inhabitant, in PPS – % of EU-27 average (=100) at NUTS 2 or similar NUTS 2 level 2006

Dispersion of regional GDP per capita (NUTS-2 regions per country)

The use of the previous different statistics of variation (mean, standard deviation, coefficient of variation) presents a very important disadvantage. They take into account each NUTS2/NUTS3 region as 1 (each unit counts as 1); however, the population potentials of these regions differ substantially. Therefore, the different weights should be taken into account into a single indicator. This is done by the calculation of the "Dispersion" of regional GDP per capita (NUTS-2 or NUTS-3 regions per country) –see below the definition of the indicator by Eurostat.

Definition of the indicator by Eurostat

Since 2007, Eurostat has been calculating a new, derived indicator which records the differences between regional per-inhabitant GDP and the national average and makes them comparable between countries. This dispersion indicator is calculated at NUTS 2 and at NUTS 3 levels. The figures used by Eurostat are based on GDP in purchasing power standards (PPS).

For a given country, the dispersion 'D' of the regional GDP of the level 2 regions is defined as the sum of the absolute differences between regional and national GDP per inhabitant, weighted on the basis of the regional share of population and expressed in percent of the national GDP per inhabitant:

D = 100 Σ n i = 1 Y 1 ¦ (yi – Y) ¦ (pi / P)

In the above equation:

- yi is the regional GDP per inhabitant of region i;
- Y is the national average GDP per inhabitant;
- pi is the population of region i;
- P is the population of the country;
- n is the number of regions in the country.

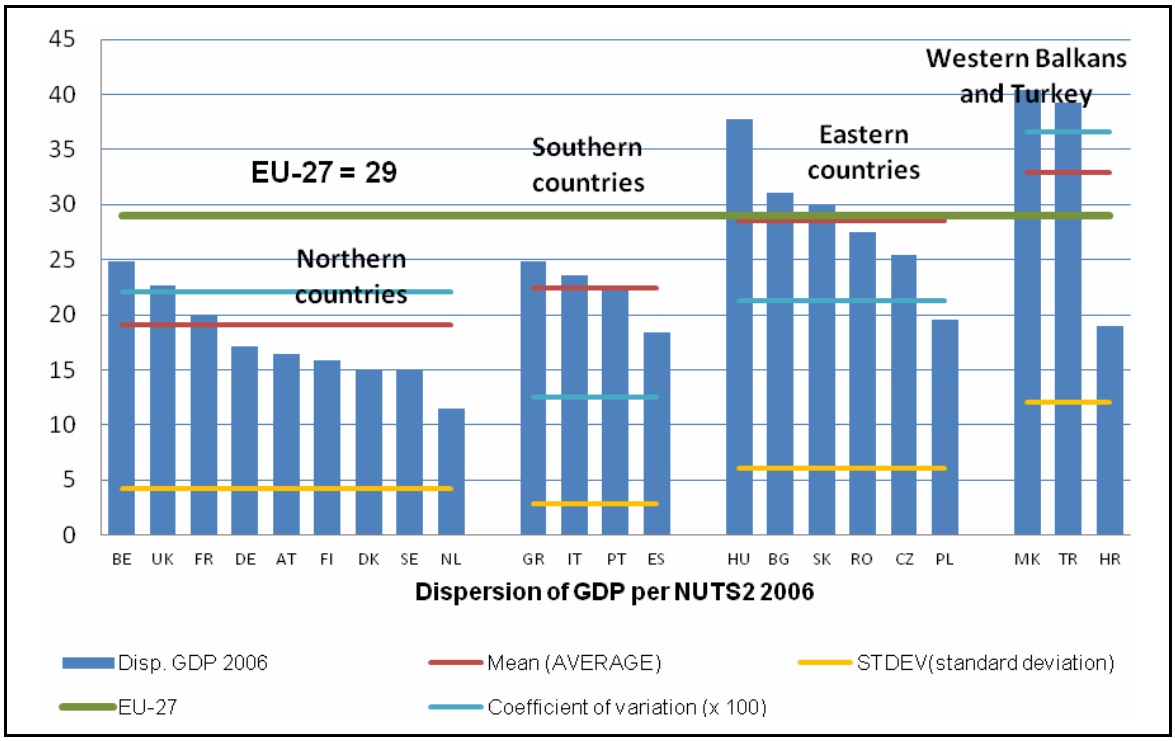
The value of the dispersion of GDP per inhabitant is zero if the values of regional GDP per inhabitant are identical in all regions of the country or economic area (such as the EU or the euro area), and it will show, all other things being equal, an increase if the differences in per-inhabitant GDP between the regions increase. A value of 30 % therefore means that the GDP of all regions of a given country, weighted on the basis of the regional population, differs from the national value by an average of 30 %.

Comparison among the four "territorial" groups of countries

For EU-27 as a whole, for NUTS-2 level, the dispersion in GDP per capita decreased over time, which means that territorial disparities in GDP were decreased.

For the same year (2006) it seems that dispersion (inequalities) is more often high in the EU east countries and in the CC/PCC – see the values of dispersion per country in the Graph 5.1.6.

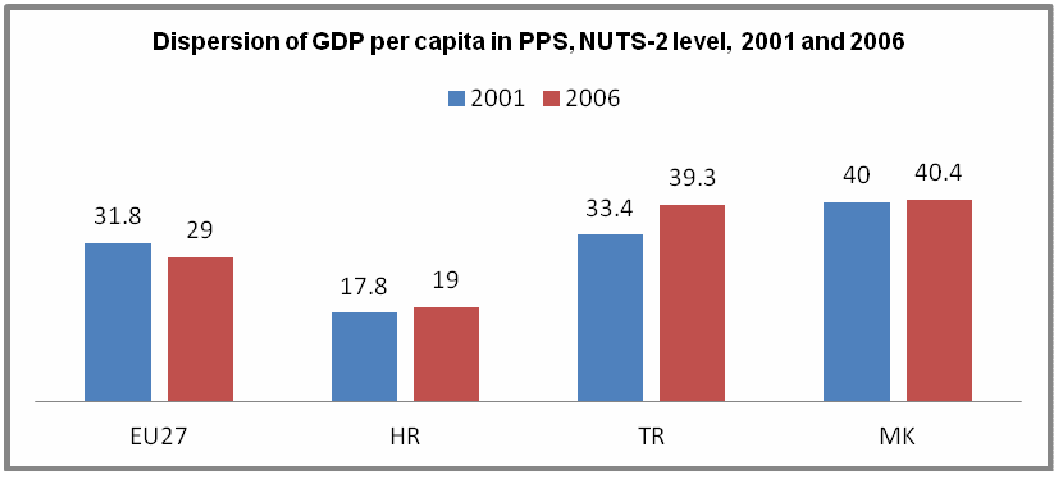
Using the mean, stdev and coefficient of variation of the dispersion values for the four groups of countries, we conclude that regional inequalities are more pronounced in the group of the CC/PCC and in the EU east. There are lower in the south and even lower in the north (see the means in the Graph 5.1.6. However, the differences among countries inside each group as for this indicator are more important in the case of CC/PCC but they are equally important in the north compared to the east (see the coeff. of variation). Inversely, the differences (variation) among the southern EU countries are lower.



Graph 5.1.6: Dispersion of GDP per EU country (NUTS 2) and CC/PCC 2006

Disparities inside the CC/PCC group

While dispersion for EU-27 decreased slightly (Graph 5.1.7), the group of CC showed a contrary trend. For HR, MK and TR (for the PCC there weren't available data) the change of the dispersion of GDP per capita at regional level between 2001 and 2006 showed that **disparities were increased**, with FYROM showing the smallest increase.



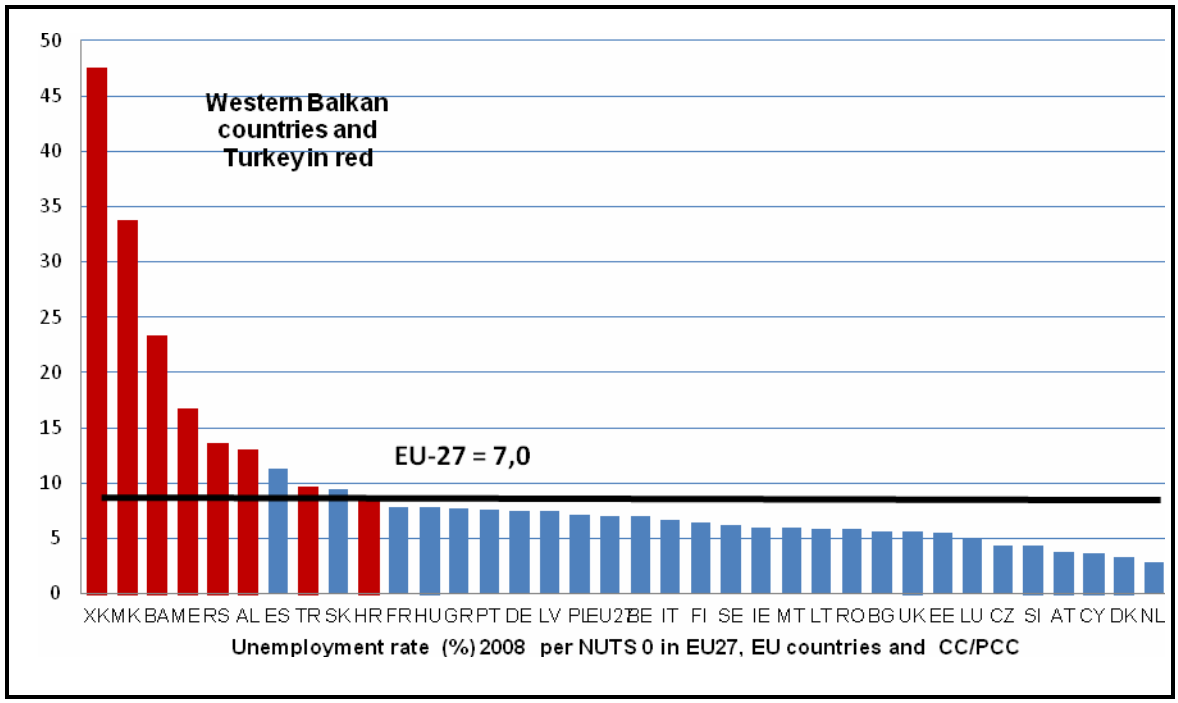
Graph 5.1.7: Dispersion of regional GDP per capita in PPS, NUTS-2 level, 2001 and 2006 (%) in the EU-27 and in CC

Source of data: Eurostat, table name: nama_r_e0digdp

Unemployment rate at country (NUTS-0) level

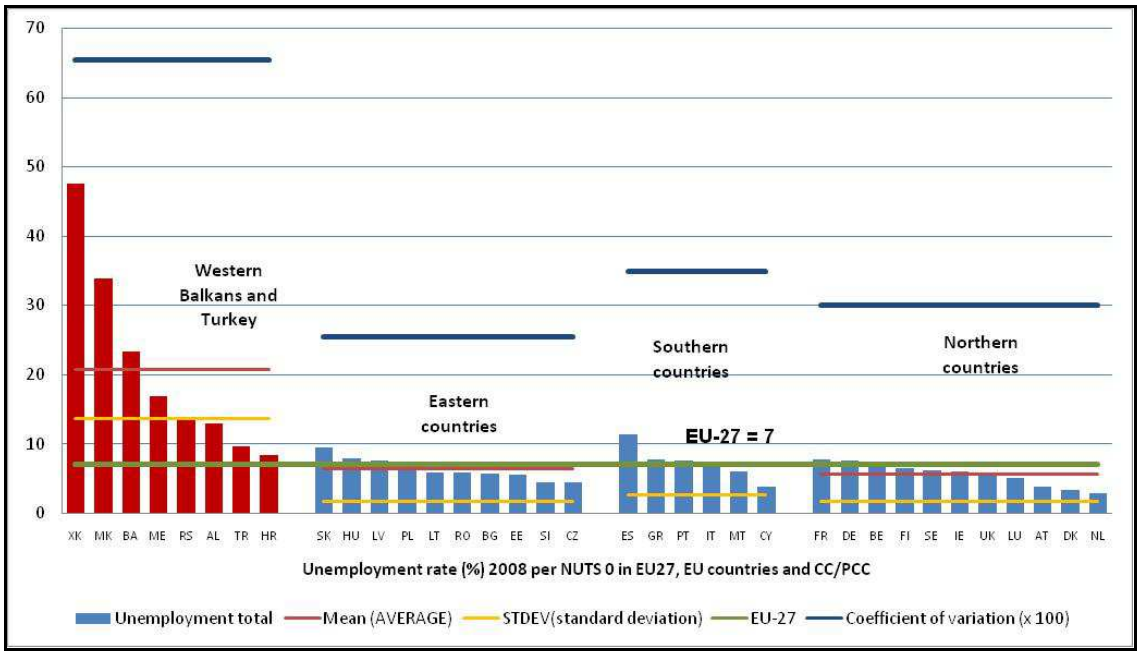
The unemployment rates for all the CC/ PCC were higher and often much higher than the EU-27 average - see in Graph 5.1.8 and Map 5.1.4.
Regarding this indicator, the CC/PCC (NUTS-0 level) except from Croatia and Turkey present a totally different pattern from that of the EU countries. Croatia and Turkey present levels of unemployment similar to the EU-27 countries with higher rates of unemployment (ES, SK).

In order to better analyse the difference of the CC/PCC (possible) pattern from those of the 3 EU-27 groups of countries we have created the Graph 5.1.8 presenting the respective statistics of variation (inequalities).
The mean of the CC/PCC group is much higher than that of the EU east (which is higher from the EU north). The values of the coefficient of variation are much higher in the CC/PCC; this means that the inequalities among these countries are very high as obviously the rates for HR and TR are much lower than the rates for XK, MK and BA which are impressively high. The EU south and EU north follow.

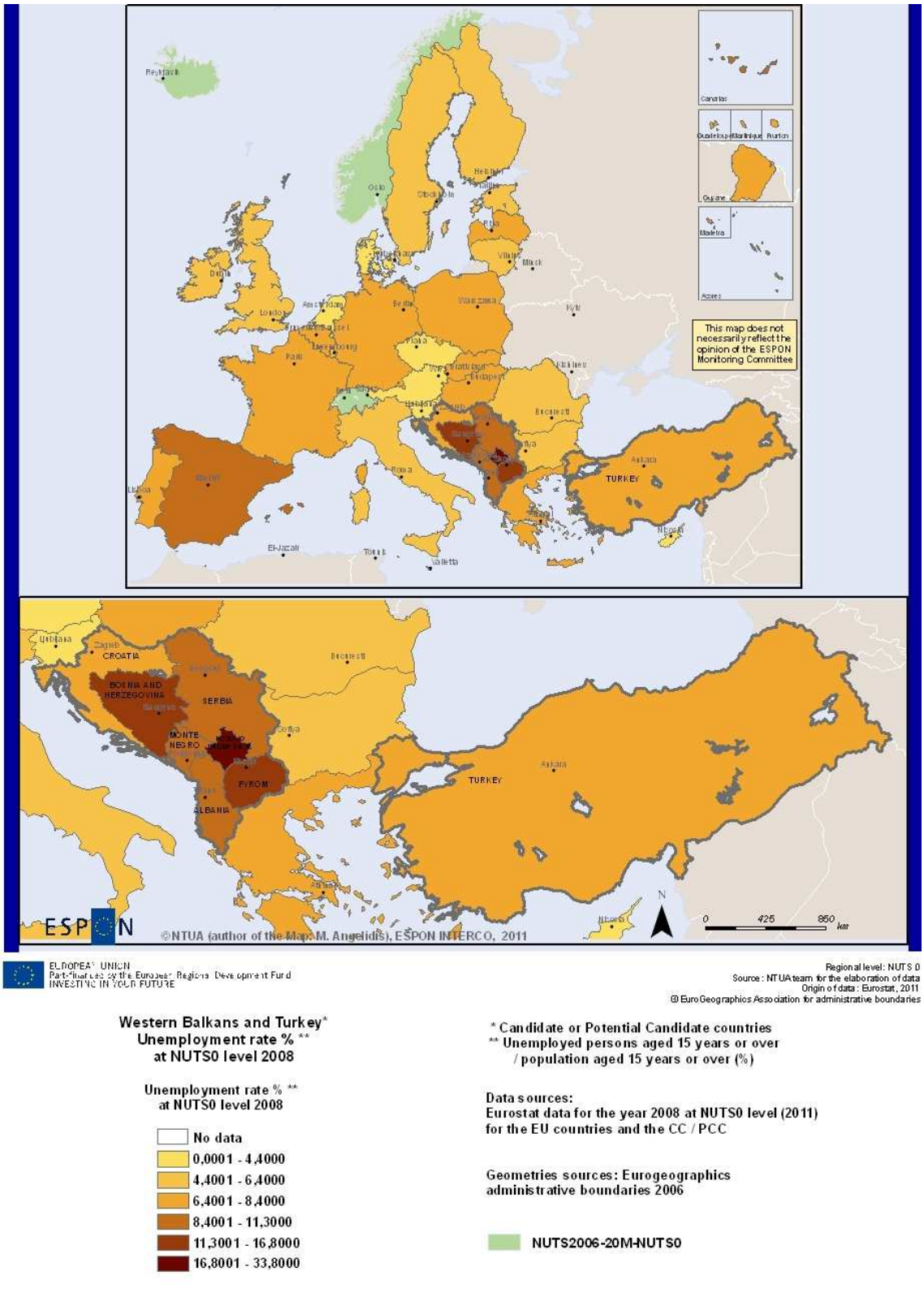


CC/PCC	AL	BA	HR	ME	MK	RS	TR	XK
2008	13	23,4	8,4	16,8	33,8	13,6	11	47,5

Graph 5.1.8: Unemployment rate (%) in 2008 per EU country (NUTS 0) and CC/PCC compared to EU-27 average



Graph 5.1.9: Unemployment rate (%) in 2008 per EU country (NUTS 0) and CC/PCC compared to EU-27 average – per groups of countries



Map 5.1.4: EU countries and CC/PCC: Unemployment rate % at NUTS 0 level 2008

Unemployment rate at sub-national level

Definition of the indicator by Eurostat

Regional (NUTS level 2) unemployment rate represents unemployed persons as a percentage of the economically active population (i.e. labour force or sum of employed and unemployed). The indicator is based on the EU Labour Force Survey. Unemployed persons comprise persons aged 15-74 who were (all three conditions must be fulfilled simultaneously): 1. without work during the reference week; 2. currently available for work; 3. actively seeking work or who had found a job to start within a period of at most three months.

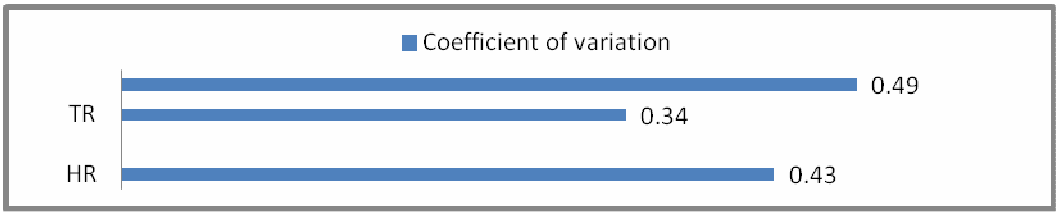
Regarding the inequalities at NUTS2 level per country inside the EU-27+CC/PCC area on 2009, we have data only for HR and TR from Eurostat and for RS from NSO.
As we have already remarked previously, the mean values for unemployment rates at national level are much higher in the three last countries compared to the EU-27 average – Graph 5.9 and Map
The coefficientss of variation in these two countries are relatively high; they are slightly lower than the respective coefficient for the EU-27 (we should be cautious about this last comparison as the number of NUTS2 regions in the EU-27 is much more important than the respective numbers for the 2 countries). See ib the Graphs 5.1.9 and 5.1.10 and the Map 5.1.5.
It seems that the regional inequalities on the base of the coeff. of variation are less important in HR and TR (in comparison with the respective coeff. for the entire EU-27; this comparison is less appropritate)

	HR	MK	TR	EU-27
max	13.7		19.9	
mean	9.57	0.00	11.63	8.74
min	5.4		4.2	

	HR	MK	TR	EU-27
standard deviation	4,15		3,90	4,25
Coeff. of variation	0,43		0,34	0,49

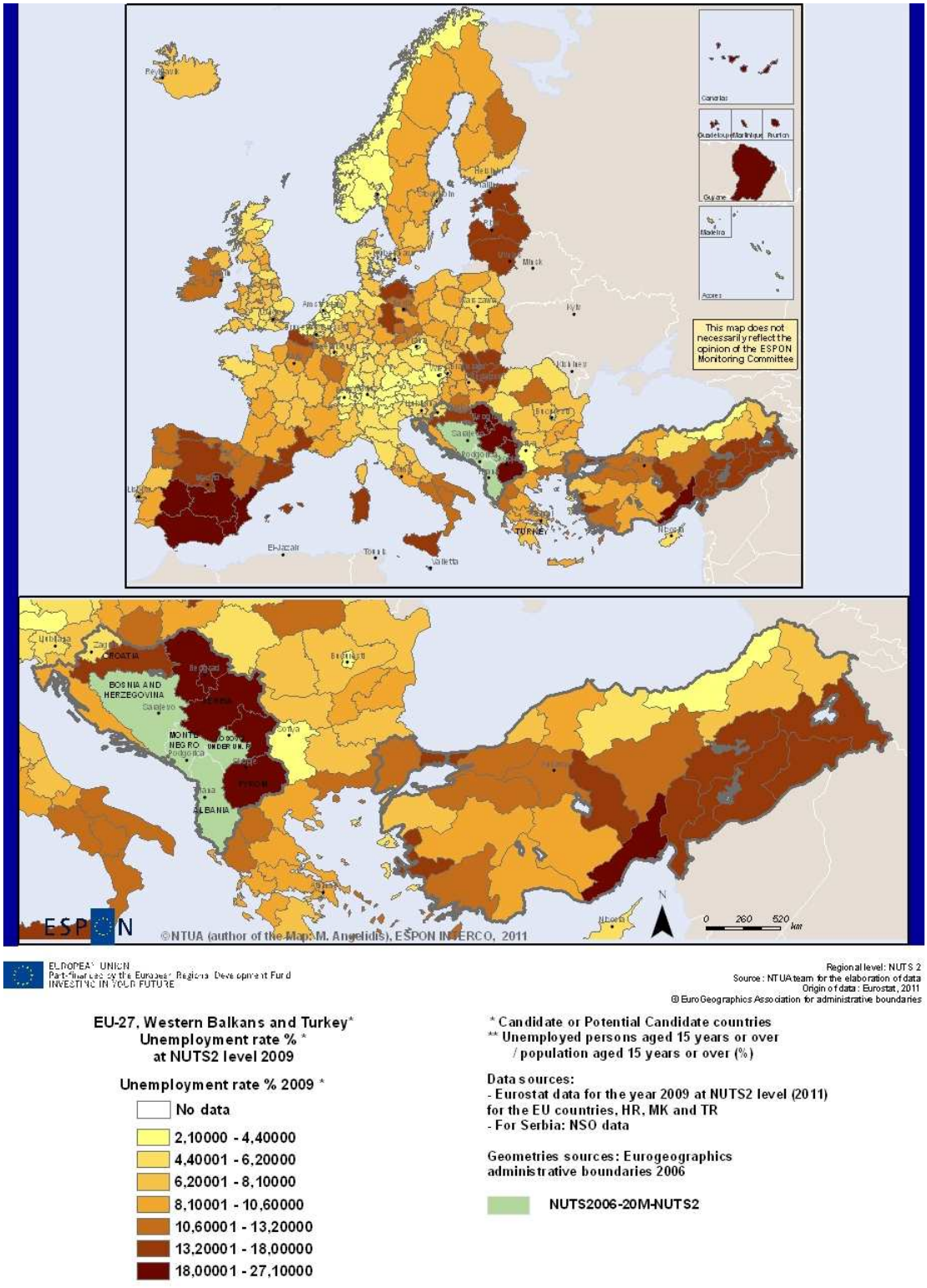
Graph 5.1.9: Unemployment rate (2009): variations within countries at NUTS-2 level.

From: Eurostat, table name: lfst_r_lfu3rt



Graph 5.1.10: Unemployment rate (2009): coefficient of variation at NUTS-2 level.

From: Eurostat, table name: lfst_r_lfu3rt



Map 5.1.5: EU countries and CC/PCC: Unemployment rate % at NUTS 2 level 2009

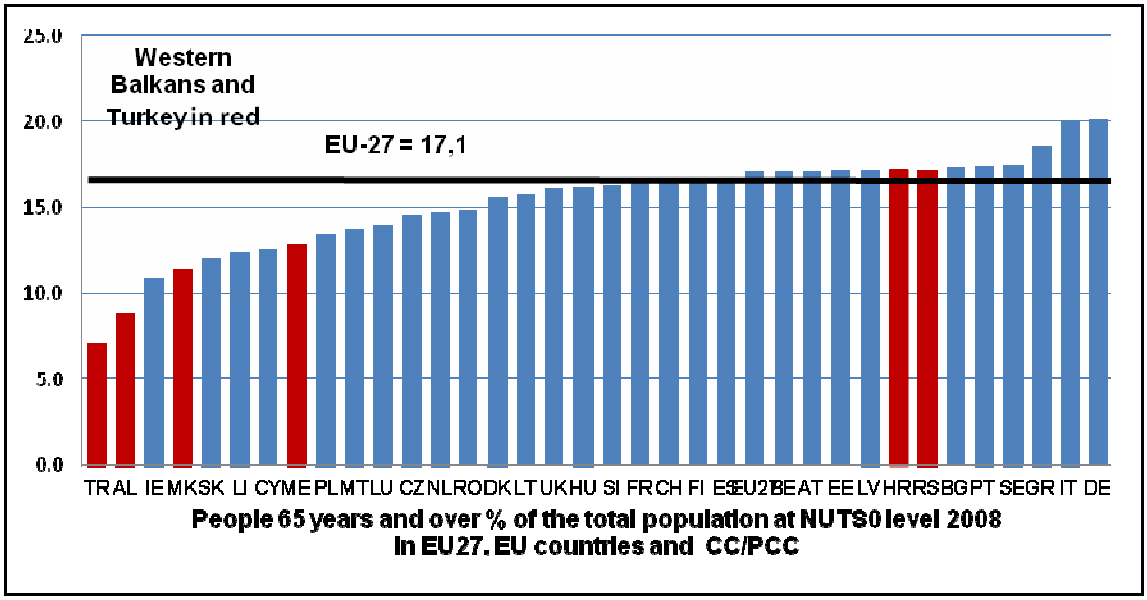
5.2: Inclusion

The indicators that were tested are: life expectancy at birth (total) and people aged 65 or over as a share of the total population (demography indicators) as well as the population density

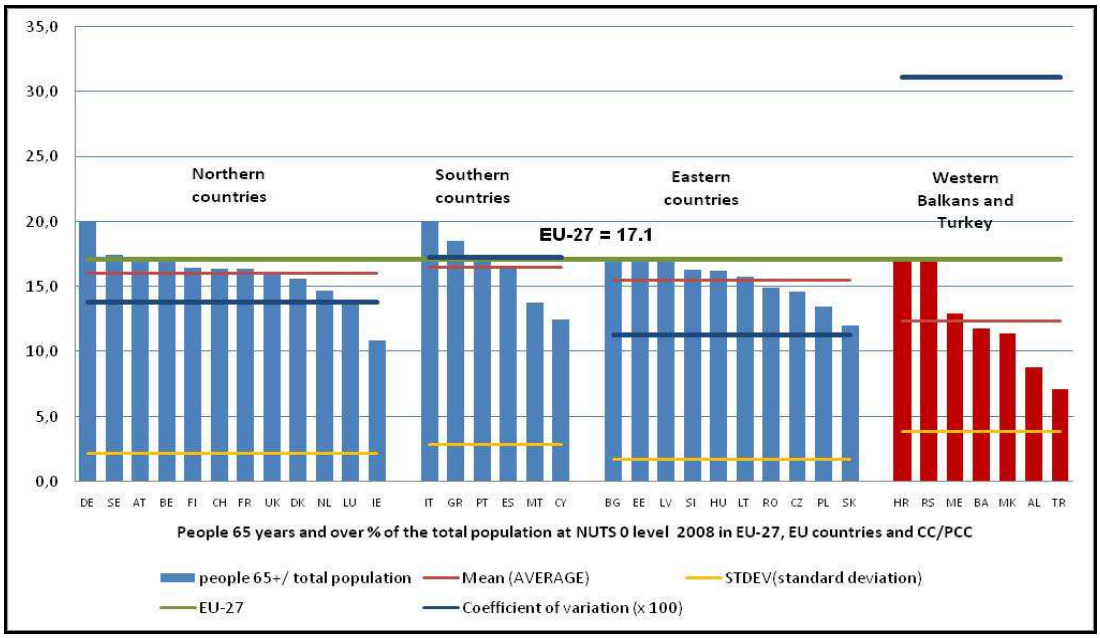
Population ageing at country (NUTS-0) level

We have used as indicator of population ageing the share (%) of the persons of 65 years and over to the total population in 2008 at NUTS0 level.
Turkey has an impressively lower rate compared to both the other CC/PCC and the EU-27 countries.

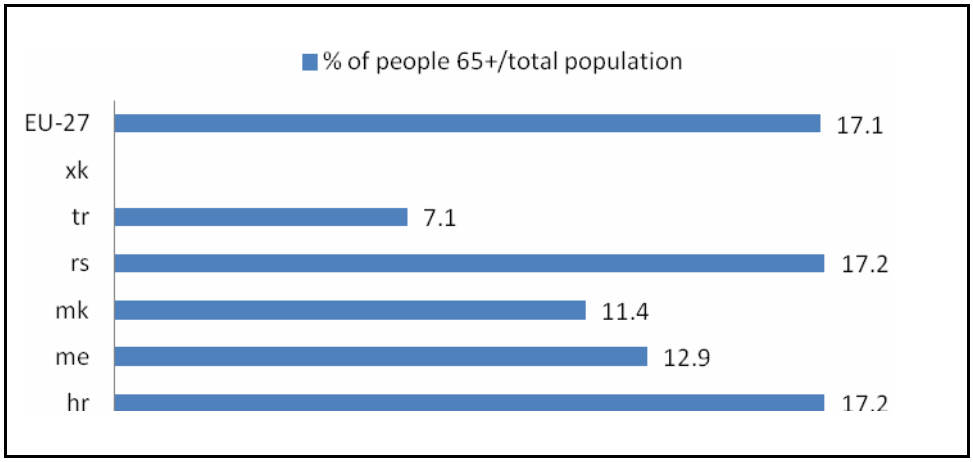
Three of the other CC/PCC: Albania, FYROM and Montenegro, have a similar pattern, clearly lower than that of the EU-27 average and the pattern of the majority of EU countries –see in Graphs 5.2.1 and 5.2.2.
On the other hand, the rates of Croatia and Serbia are slightly higher than the EU average.
Disparities among the members of the CC/PCC area are much higher than in the EU south, north and east –see in the Graphs 5.2.2 and 5.2.3 (the coeff. of variation) and the Map 5.2.1.



Graph 5.2.1: Percentage of the 65+ population in the total in 2008 at NUTS0 level in EU-27, EU countries and CC/PCC.

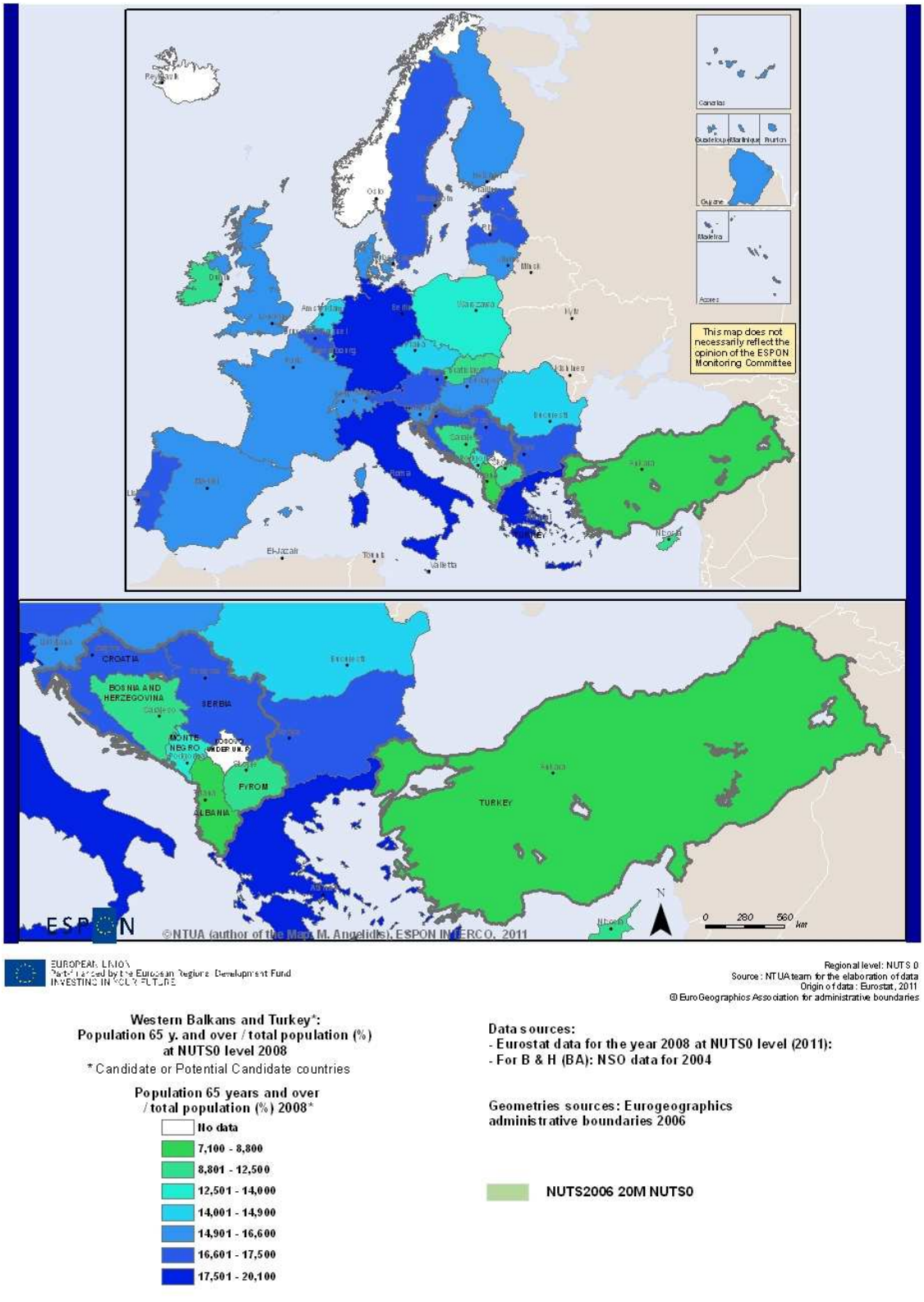


Graph 5.2.2: Percentage of the 65+ population in the total in 2008 at NUTS0 level in EU-27, EU countries and CC/PCC – per groups of countries



Graph 5.2.3: People aged 65+ as a percent of total population (2008) at NUTS-0 level.

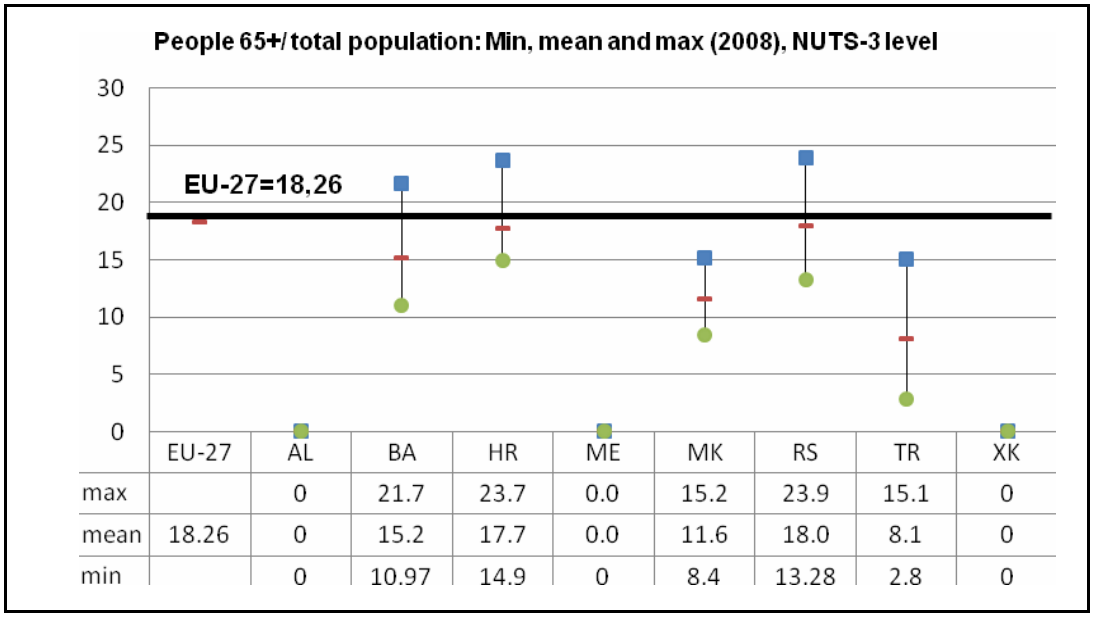
Source of data: Eurostat, table name: demo_pjanind (2011)



Map 5.2.1: EU countries and CC/PCC: Population 65 years and over Rate % at NUTS0 level 2008

Population ageing at sub-national level

This indicator was tested at sub national level (NUTS-3), as there were data for most of the CC/ PCC countries.
The intra-national disparities (coeff. of variation) are higher in BA and TR compared to the rest CC/PCC -see in Graphs 5.2.4 and 5.2.5 and Map 5.2.2.

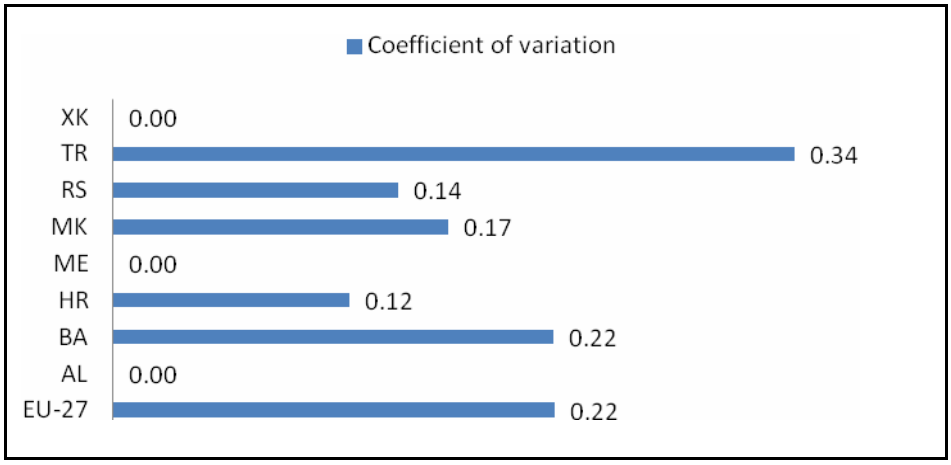


	EU-27	AL	BA	HR	ME	MK	RS	TR	XK
max		0	21.7	23.7	0.0	15.2	23.9	15.1	0
mean	18.26	0	15.2	17.7	0.0	11.6	18.0	8.1	0
min		0	10.97	14.9	0	8.4	13.28	2.8	0

EU – CC/PCC	EU-27	AL	BA	HR	ME	MK	RS	TR	XK
Standard deviation	4,08	0	5,73	2,08	0	1,93	2,55	2,74	0
Coeff. of variation	0,22	0	0,42	0,12	0	0,17	0,14	0,34	0

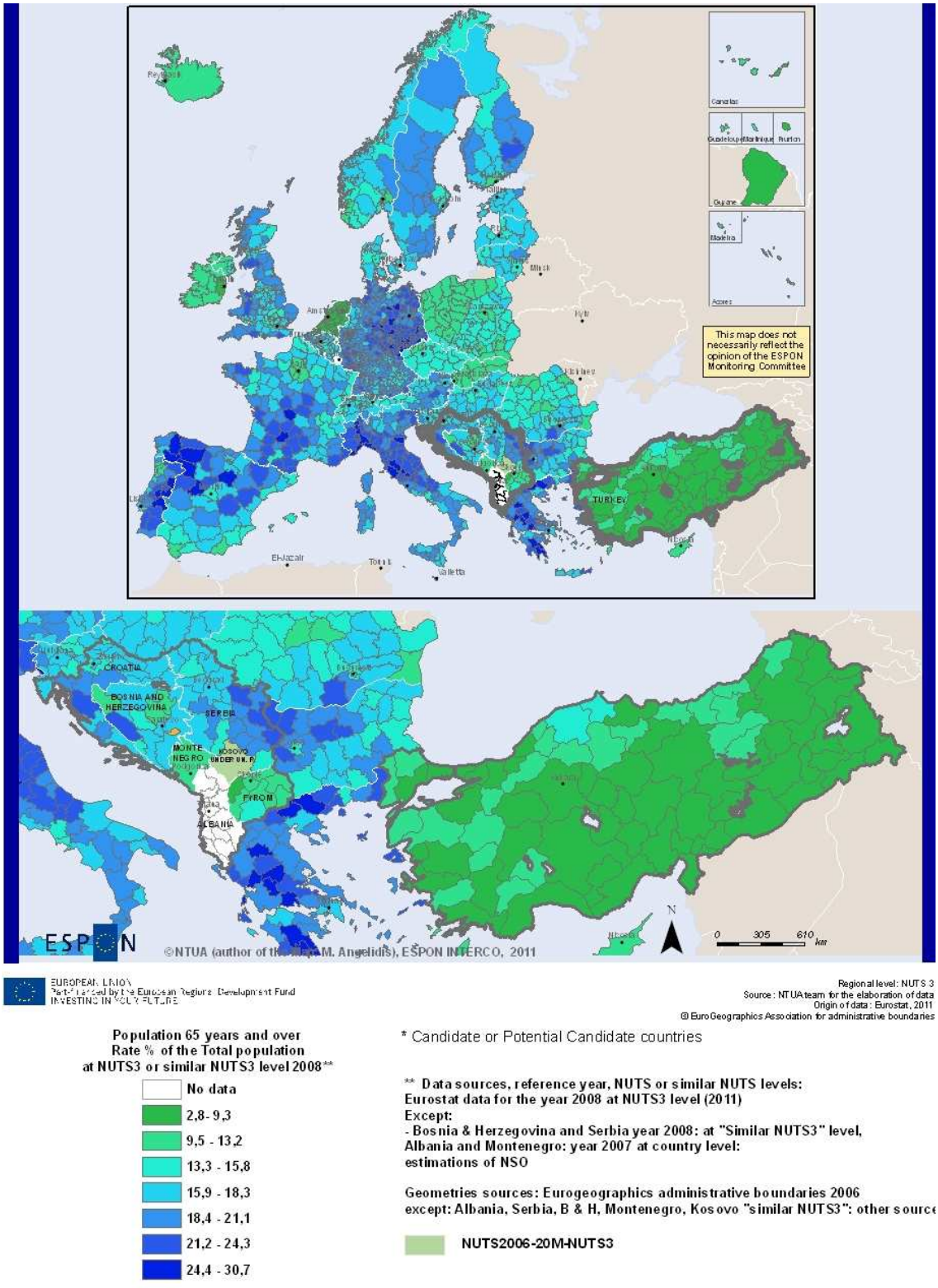
Graph 5.2.4: People aged 65 and over as % of total population): variations within countries at NUTS-3 level and EU-27 mean 2008

Source of the data: Eurostat, table name: demo_r_pjanaggr3



Graph 5.2.5: People aged 65 and over as % of the total population (2008): coefficient of variation measured at NUTS-3 level

Source of the data: Eurostat, table name: demo_r_pjanaggr3



Map 5.2.2: EU countries and CC/PCC: Population 65 years and over Rate % at NUTS3 or similar NUTS3 level 2008

Life expectancy at birth (total population) at country (NUTS-0) level

Definition of the indicator by Eurostat

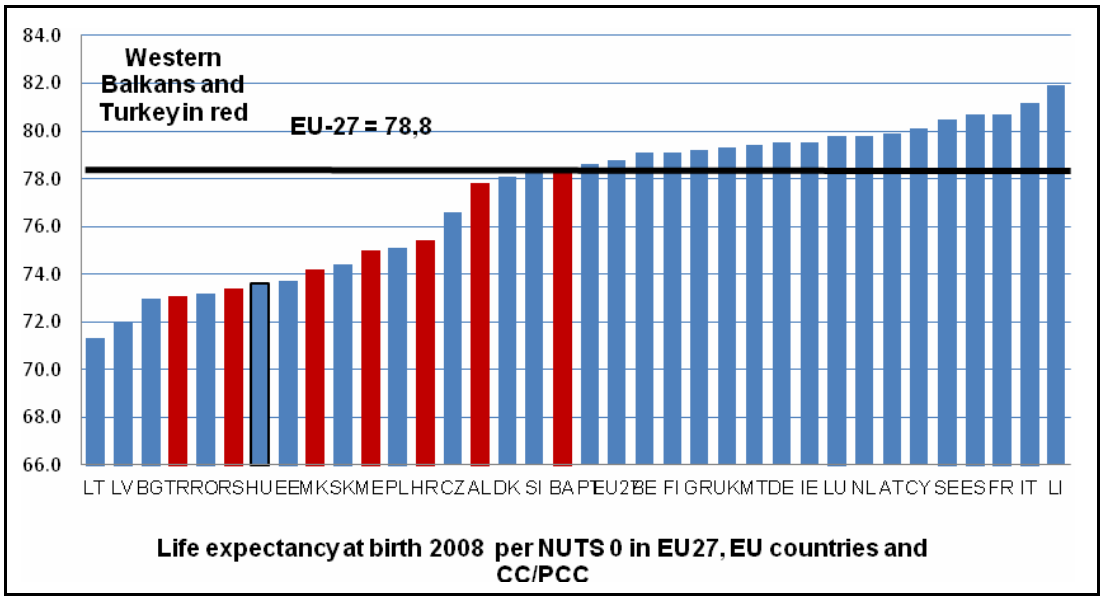
Life expectancy at certain ages represents the mean number of years still to be lived by a person who has reached a certain exact age, if subjected throughout the rest of his or her life to the current mortality conditions (age-specific probabilities of dying).

Life expectancy (LE) at birth (total population) in all CC/ PCC for 2008 is lower than in the EU-27 average –see in the Graphs 5.2.6 and 5.2.7 and the Map 5.2.3.

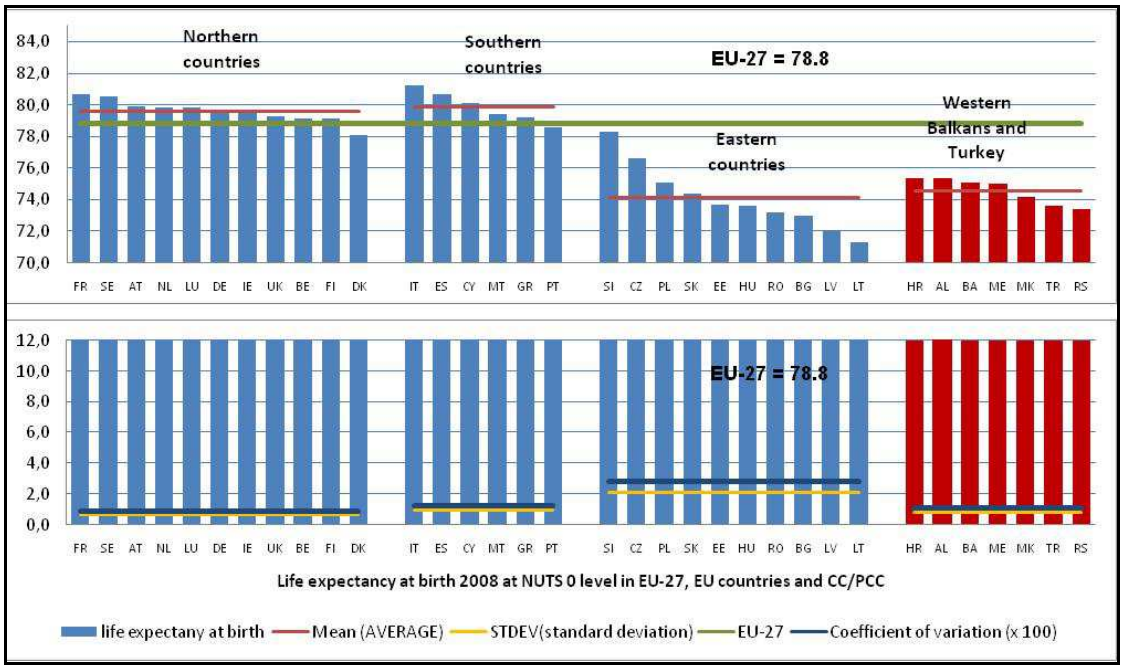
The values of LE in the CC/PCC are clearly closer to those for the Eastern EU countries

Inside the group of CC/PCC, AL and BA present the higher values of LE, while HR, and ME belong to a second rank and MK, RS and TR present similarly lower values of LE.

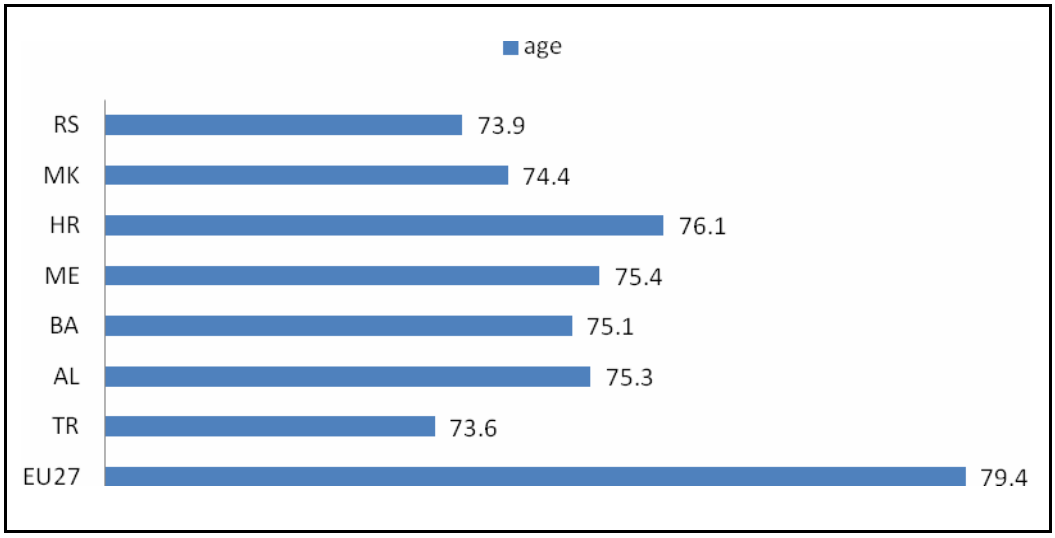
The ccoefficient of variation of the CC/PCC space is lower than that for the EU east; this means that the variation (inequalities) among the different CC/PCC is lower than that for the EU east –see in Graph 5.2.7.



Graph 5.2.6: Life expectancy at birth 2008 per NUTS 0 in total EU-27, EU countries and CC/PCC

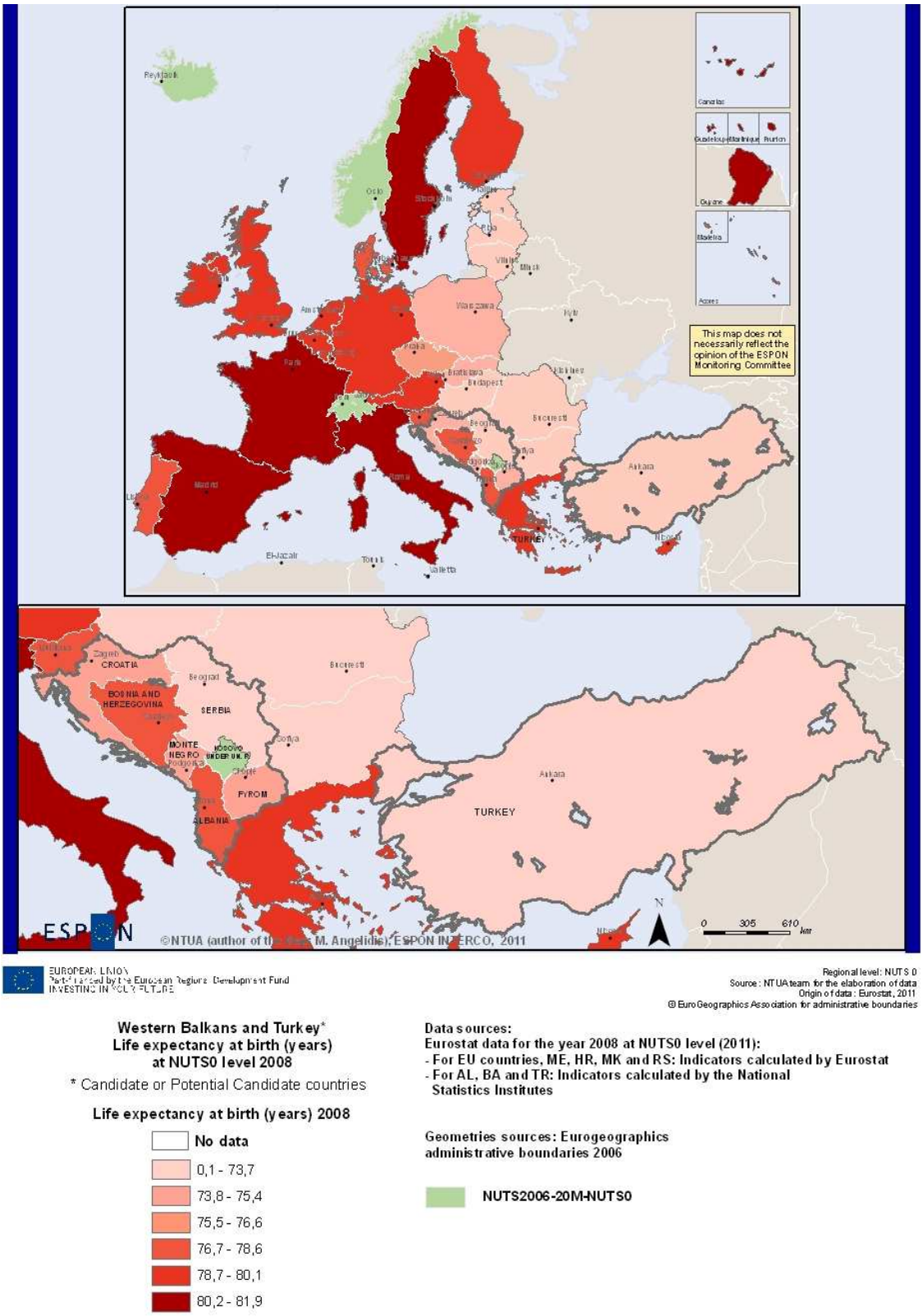


Graph 5.2.7: Life expectancy at birth 2008 per NUTS 0 in total EU-27, EU countries and CC/PCC



Graph 5.2.8: Life expectancy at birth (total population) in 2008 in years at NUTS0 level

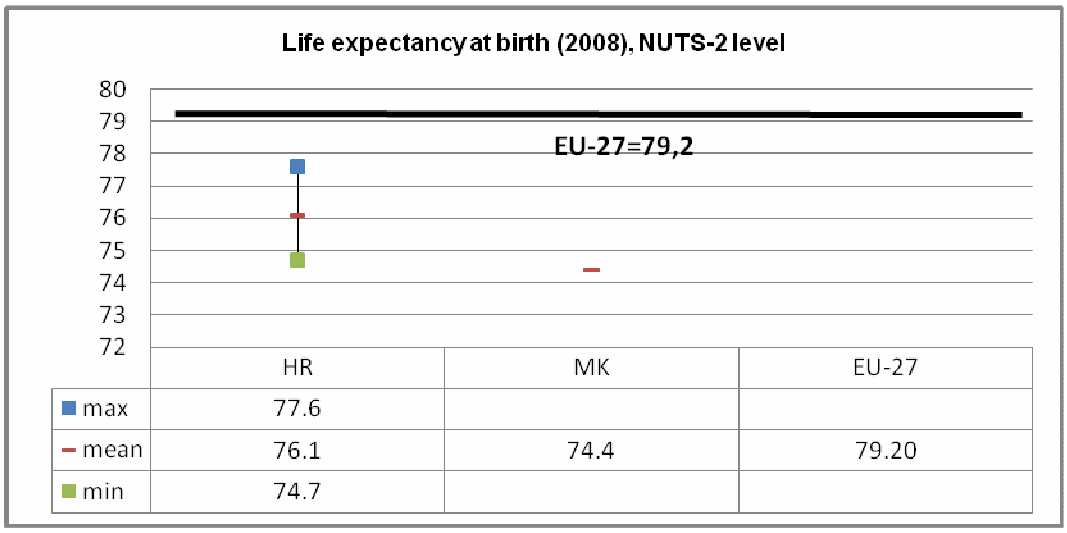
Source of the data: Eurostat. For Albania, Bosnia & Herzegovina and Turkey the data was taken from Eurostat which has used calculations by the National Statistical Institutes.
(table name: demo_mlexpec)



Map 5.2.3: EU countries and CC/PCC: Life expectancy at birth at NUTS0 level 2008

Life expectancy at birth (total population) at sub-national level

Life expectancy in HR and MK NUTS-2 regions (where data is available) is much smaller than the EU-27 average – Graphs 5.2.9 and 5.2.10 and Map 5.2.4.
If we use (even with doubts) the coefficient of variation for all the EU-27 regions which amounts to 0,04, it seems that the internal to HR variation is comparatively low: 0,02.

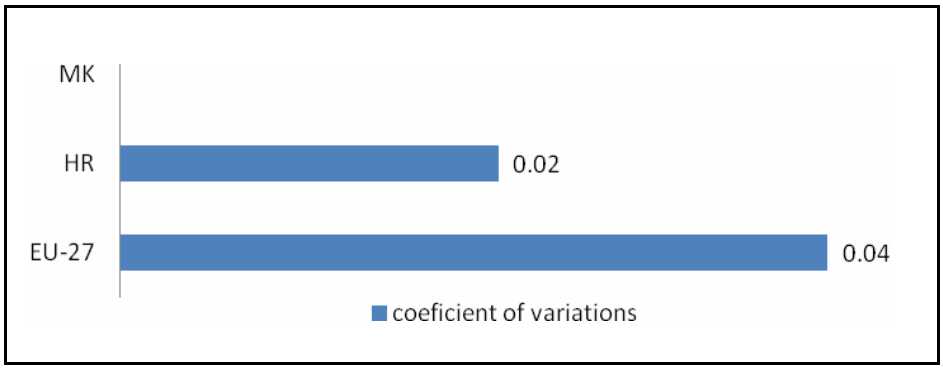


	HR	MK	EU-27
max	77.6		
mean	76.1	74.4	79.20
min	74.7		

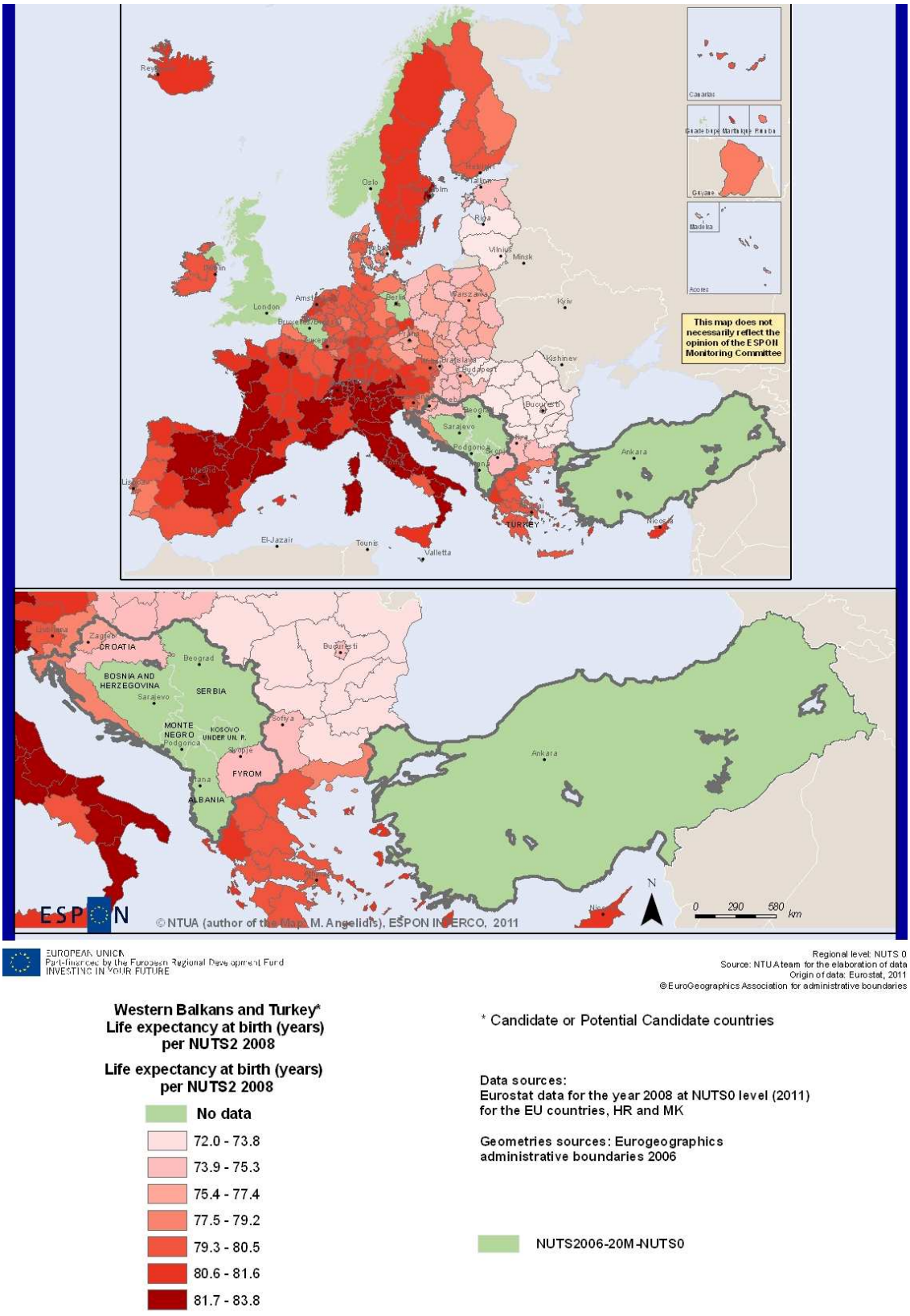
	HR	MK	EU-27
standard deviation	1,46		2,84
Coeff. of variation	0,02		0,04

Graph 5.2.9: Life expectancy at birth (2008): variations within CC/PCC and EU-27 at NUTS-2 level.

From: Eurostat, table name: demo_r_mlifexp



Graph 5.2:10: Life expectancy at birth, total (2008): coefficient of variation at NUTS-2 level. From: Eurostat, table name: demo_r_mlifexp

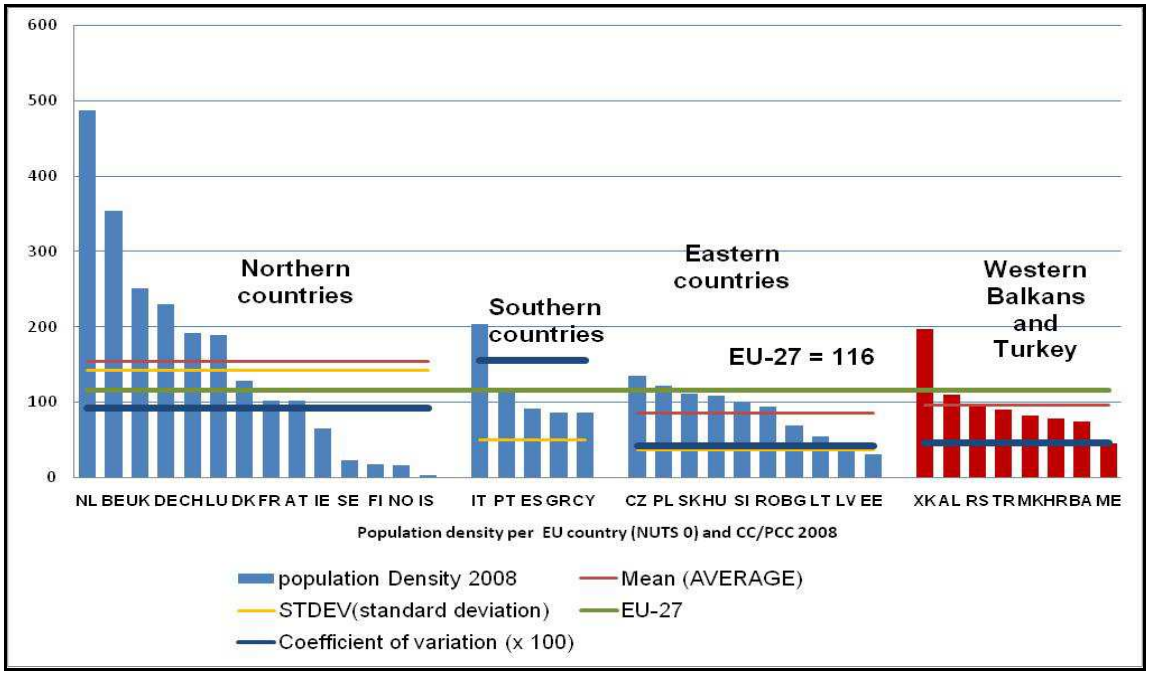


Map 5.2.4: EU countries and CC/PCC: Life expectancy at birth in 2008 at NUTS 2 or similar NUTS 2 level 2008

Population density at country (NUTS-0) level

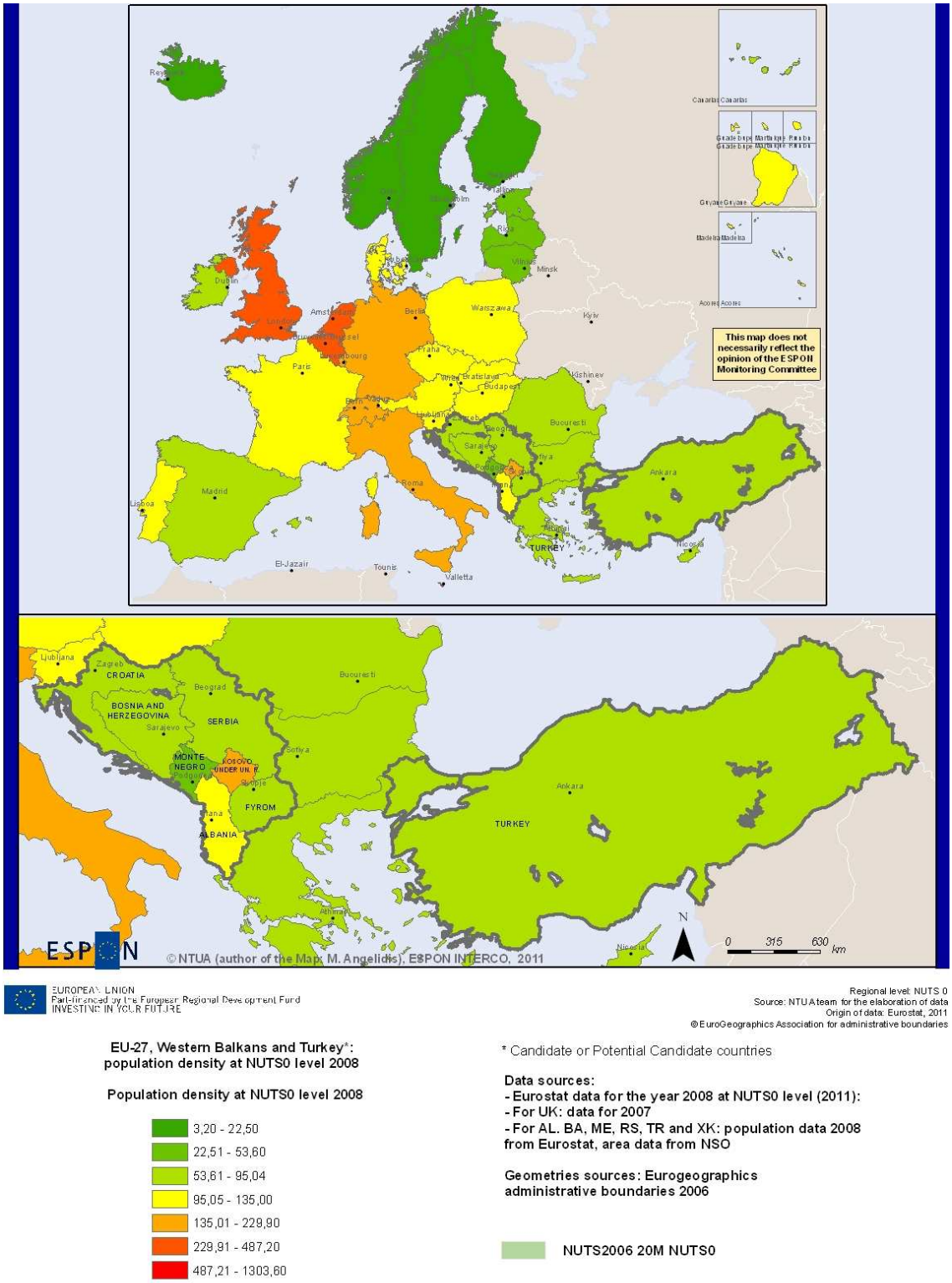
Definition of the indicator by Eurostat
Population density is the ratio between (total) population and surface (land) area

Population density is an important component of both competitiveness and inclusion. It is an index of agglomeration economies which improve regional competitiveness. Dense populated regions (even more –among these last- the capital regions and, more widely, the metropolitan regions) are usually more competitive.
On the other hand, according to the literature, dense populated regions have a different inclusion pattern from the under populated ones.
Population density rates in the CC/PCC (2008) are similar to those for the EU Eastern countries. The means in the two cases are slightly lower than the EU-27 average - Graph 5.2.11 and Map 5.2.5. The respective means for the EU north and south are higher than the EU mean.
Inside the CC/PCC area, XK rate is much higher than the EU-27 average while the density of ME is much lower than the latter.
The coefficient of density variation among the CC/PCC is low; it is equal to that of the EU east. The EU north and EU south have higher values



Graph 5.2.11: Population density per EU country (NUTS 0) and CC/PCC 2008 *

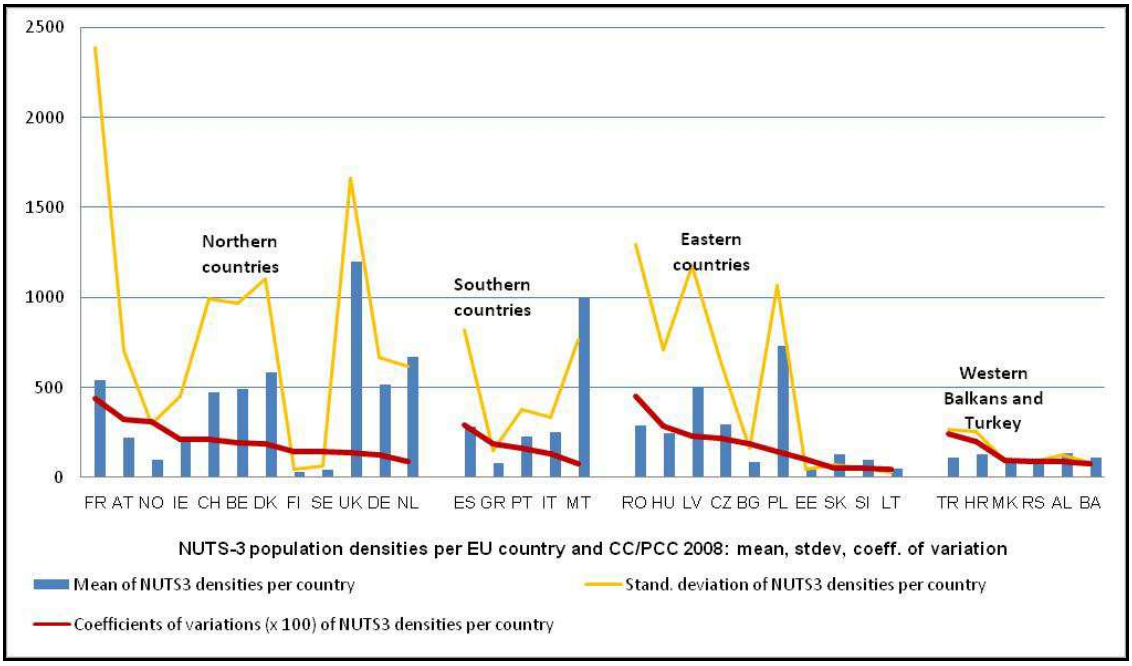
* We have excluded Malta (MT) which has a very high pop. density 2008 (1303 inh.) - in order to enhance the visibility of the graph



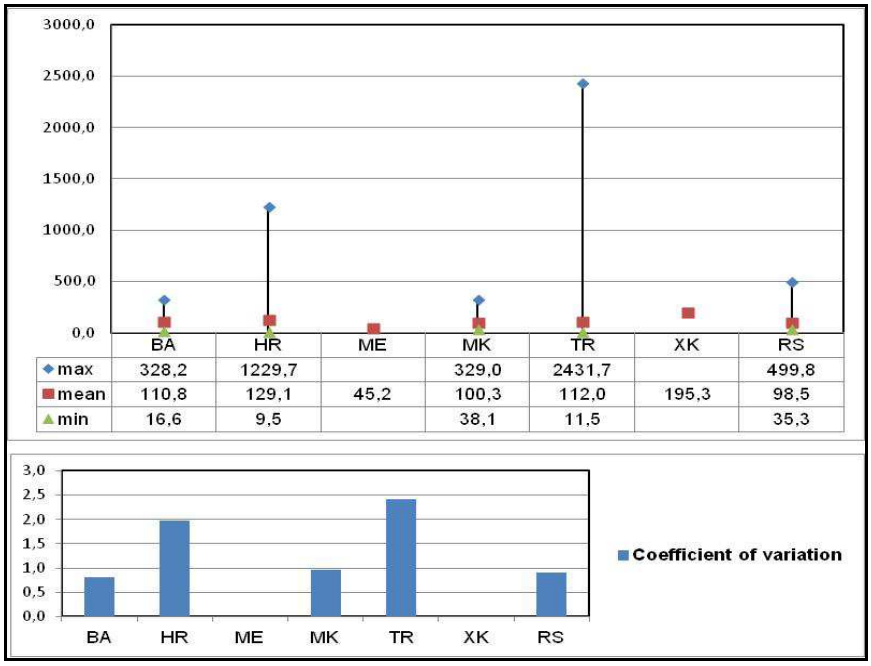
Map 5.2.5: EU countries and CC/PCC: Population density at NUTS0 or similar NUTS0 (country) level 2008

Population density at sub-national (NUTS-3) level

We present in the Graph 5.2.12 the coefficients of variation for all the EU-27 countries and the CC/PCC. TR and HR present a pattern of higher inequalities among the NUTS-3 regions while the rest CC/PCC have a clearly lower pattern.
See also the Graph 5.2.13 and the Map 5.2.6.

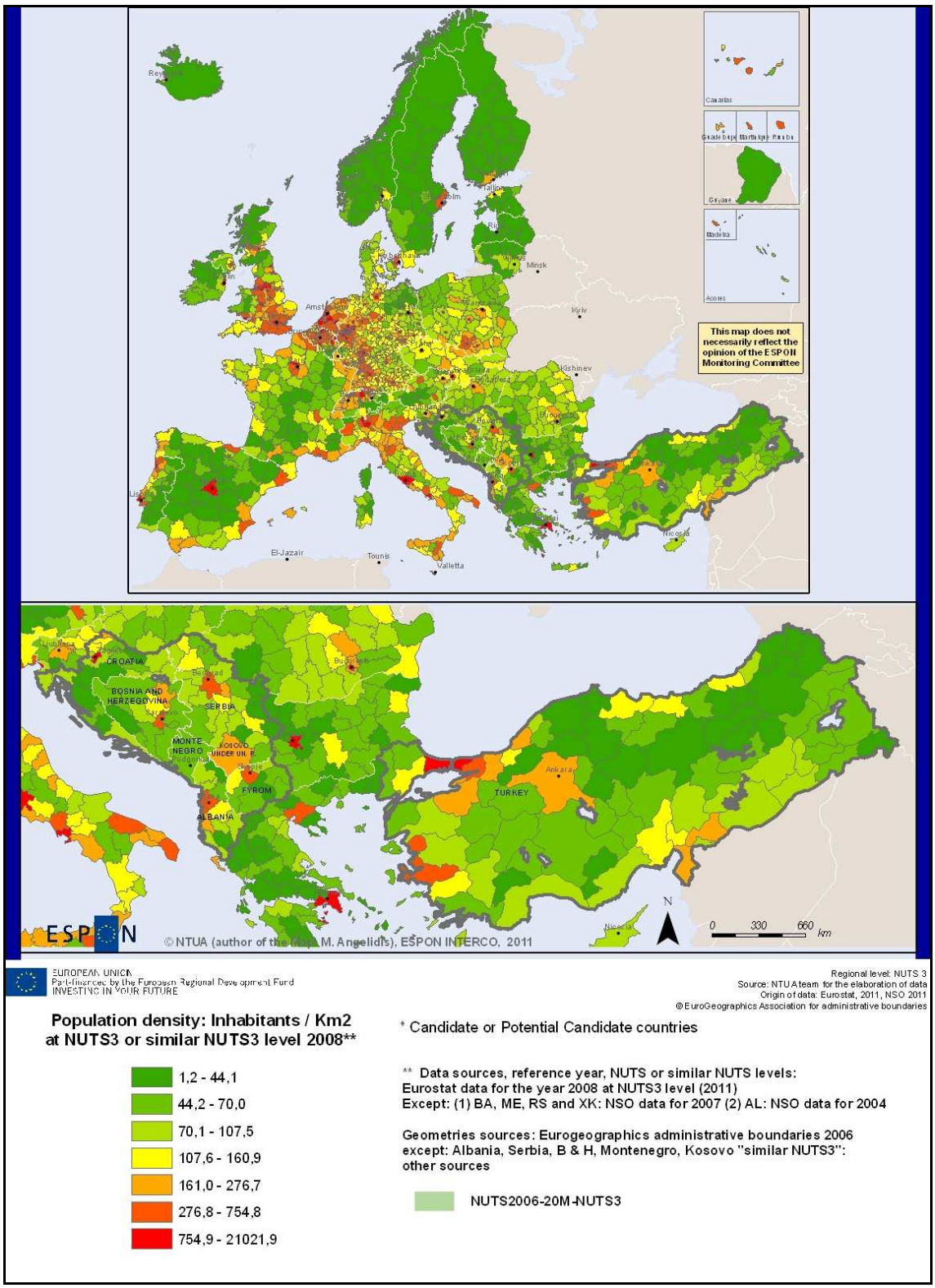


Graph 5.2.12: Coefficients of variation of NUTS-3 densities per EU country and CC/PCC 2008



	BA	HR	ME	MK	TR	XK	RS
max	328,2	1229,7		329,0	2431,7		499,8
mean	110,8	129,1	45,2	100,3	112,0	195,3	98,5
min	16,6	9,5		38,1	11,5		35,3

Graph 5.2:13: Population density in the CC/PCC 2008 at NUTS-3 level: min, mean, max, standard deviation and coefficient of variation



Map 5.2.6: EU countries and CC/PCC: Population density at NUTS3 or similar NUTS3 level 2008

6. Conclusions and policy recommendations

6.1. Conclusions

We started from the general hypothesis that **there is a TC pattern** (a substantial degree of homogeneity) **for the CC/PCC** which differs clearly from that for the entire EU-27. This last could be certainly divided into three distinct territorial parts: the EU north, south and east, on the basis of clearly different levels of competitiveness: higher, moderate and lower, respectively. The literature approach of the economic performance features of the CC/PCC provided us first arguments on the existence of a TC pattern for the entire territory of CC/PCC (total of the countries) which is similar to the EU east one but clearly less performing / competitive compared to the latter.
Further on, the specific analysis of the different TC dimensions on the basis of indicators at country level, showed that regarding the majority of the dimensions and "sub-dimensions" (more specific aspects of each dimension) there are specific patterns for the total of CC/PCC which are comparatively close to the EU east ones (and much and very much distant to the EU south and north, respectively); however, the respective indicators' values are often substantially different.

Inside the CC/PCC total, TC inequalities per country are pronounced.

Regarding mainly the competitiveness, HR and TR, which are candidates to join EU, are equally performing with the two "weaker" EU east countries: RO and BG. ME and RS perform less in economy than HR and TR and present also similar values regarding indicators of several other TC dimensions. MK, BA, AL and XK, even less developed, present a relative homogeneity regarding several TC dimensions.

Specifically, **per TC dimensions:**

- Regarding ***competitiveness****:*

We have examined in more depth indicators on economy as well as on employment / unemployment.

From the analysis in more depth of the GDP rates and the dispersion of regional GDP, we conclude that, apart from the inequalities regarding **GDP rate** mentioned above, it seems that **dispersion (regional inequalities) in GDP per capita** is more often high in the EU east countries and in the CC/PCC compared to the rest of EU-27. While, between 2001 and 2006, dispersion for EU-27 decreased slightly, it increased in HR, TR and MK.
In addition, it results from the analyses of the "Pocketbook" at country level that the **GDP growth rates** in these countries from 2003 were much higher than the average rate for the EU-27. **Income inequality increased in all CC/ PCC except Turkey where it fell but still to a level well above the EU-27 figure.**
However each of the CC/ PCC has a **trade deficit** every year, in contrast to the surplus for the EU-27. The share of **the rural sector in these countries remains much higher** than in the EU-27 (especially in Turkey) while **their service sector records increase rates more important than in the EU-27**. Their industrial sector decreases as in the EU-27.
Inward FDI in CC/PCC increases considerably (with the exception of the period after 2007) but **the FDI intensity ratio** reflecting the level of integration of a country with the international economy **remains much lower than in the EU-27**.

The total number of persons employed increases in these countries less than in the EU-27 and they do not record increases in labour productivity.
The CC/ PCC present **lower rates of active population, employment and activity rate of the older population**.

From the analysis in more depth of the **unemployment** rates, it results that for all the CC/ PCC **these rates were higher than the EU-27 average and much higher for XK, MK and BA.** Regional unemployment' inequalities in HR and TR are relatively high.
In addition: In 2008 the **long- term and youth unemployment rates for the CC/ PCC were higher** and often much higher than the EU-27 average.

- Regarding ***"Innovation"***

Gross domestic expenditure on research and development (GERD) as a share of GDP **remains in the CC/ PCC much lower than in the EU-27.**

- Regarding ***"inclusion":***

The CC/ PCC reported **increases in population, with the exception of Serbia and Croatia**.

From the analysis in more depth of the **population ageing** at country level, it results that TR, AL, MK and ME have clearly less aged population than the EU-27 average and the pattern of the majority of EU countries. Disparities among the members of the CC/PCC area are much higher than in the EU south, north and east.
The intra-national disparities (sub-national level) are higher in BA and TR compared to the rest CC/PCC.

The analysis in more depth of the **Life expectancy** (LE) at birth **in all CC/ PCC** for 2008 **is lower than the EU-27 average**. The values for the CC/PCC are clearly closer to those for the EU east. Inside the group of CC/PCC, AL and BA present the higher values, HR, and ME moderate ones and MK, RS and TR lower values.
In addition: LE for both male and female is also **lower than in the EU-27 average.**

The respective in depth analysis proved that national **population density** rates in the CC/PCC (2008) are similar to those for the EU Eastern countries. The means in the two cases are slightly lower than the EU-27 average. Regarding inequalities among the NUTS-3 regions, TR and HR present clearly higher values while the rest CC/PCC have a lower pattern.

The **shares of tertiary graduates in science and technology** in the population as well as **the public sector investment in education** (as share of the GDP) **are clearly lower** in all CC/ PCC compared to the EU-27 averages.

- Regarding the ***"environment quality"***:

Only for two indicators:
- **Municipal waste collected per inhabitant is much lower in the CC/ PCC**.
- During the period 1998 to 2007 the EU-27 **greenhouse gas emissions** fell, while emissions **in the two countries for which data are available (Croatia and Turkey), increased significantly.**

- Regarding ***"energy":***

In all CC/PCC, energy efficiency is clearly lower than in the EU-27 while the shares of renewable energy are lower in the CC/ PCC compared to the EU-27.

- Regarding ***"connection":***

The CC/ PCC showed a small increase in their rates concerning transport infrastructure and freight, but are still very low in comparison to the EU-27.
In addition, the **proportion of households with internet access in most of the CC/ PCC was less than a half that of the EU-27.**

More general conclusions:

Undoubtedly, regarding each dimension or, even more, each sub-dimension of TC **at country level**, the CC/PCC present important differences from the TC pattern already developed in the EU-27 both at national and sub-national level. Specifically, the "scores" of the indicators of CC/PCC for the respective TC dimensions are in most cases similar to the "scores" for the EU eastern countries; however they are different in some other cases.

The "sub-group" of CC/PCC composed from HR and TR has in many cases scores similar to the EU eastern countries but not in all cases. The other "sub-groups" of the CC/PCC –see previously- present often "worse" scores.

Results at **sub-national level** which constitute a more crucial component of the territorial aspect of cohesion are relatively poor because of the lack of data in most cases for the CC/PCC. Therefore the provision of the missing data at this level for the CC/PCC is necessary –see in next the respective recommendations.

Further on:

The previously presented conceptual and technical / statistical analyses on the basis of the headline / core and final indicators of INTERCO constitute also a test of both the selection of the headline / core and final indicators in INTERCO and the methods to use these indicators in order to approach territorial challenges and TC policy priorities. **The results of this test were satisfactory for the most regarding the country level and less satisfactory for the sub-national level** (because of the lack of data). Interesting answers for the actual territorial challenges and the implementation of TC policy priorities were given; these answers go to some extent beyond the answers given by the existing literature which has not exploit systematically the TC indicators.

However, apart from the un-sufficient coverage of the sub-national level, important deficiencies regarding the exploitation of the TC indicators remain. We do not know the impact (the weight) of each indicator "translating" a specific aspect ("sub-dimension") of each TC dimension on this dimension. Further on, we do not know the impact (the weight) of each TC dimension to the TC seen globally.

These questions have been examined to some extent in the part of INTERCO referred to "local" scale ("local" case studies)

6.2. Policy recommendations

We propose below policy recommendations for the improvement of territorial data collection on the CC / PCC.

Regarding the availability of data: Four CC: Croatia, FYROM, Montenegro and Turkey produce already data which are in line with the specifications of Eurostat.

The PCC should gradually be in line with the latter specifications concerning an important number of themes interesting TC. They should produce data corresponding by first priority to the "final" and by second priority to the headline and core indicators of INTERCO.

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- Bosnia and Herzegovina: Agency for statistics of Bosnia and Herzegovina: http://www.bhas.ba, Federation of Bosnia and Herzegovina Federal office of Statistics: http://www.fzs.ba and Republika Srpska Institute of Statistics: http://www.rzs.rs.ba
- Croatia: CROSTAT, Republic of Croatia – Central Bureau of Statistics: http://www.dzs.hr/

- FYROM: Republic of Macedonia State Statistical Office: http://www.stat.gov.mk/
- Serbia: Serbia Republic Statistical office: http://webrzs.stat.gov.rs/WebSite/
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Annex 1. NUTS and regional / territorial classification

We first had to assess ***the conformity of the WB and Turkey spatial administrative divisions to the EU NUTS classification criteria.***

According to Eurostat, **NUTS – Nomenclature of Territorial Units for Statistics**, 2010[32], the NUTS classification is a hierarchical system for dividing up the economic territory of the EU for the purpose of:

- The collection, development and harmonisation of EU regional statistics:
- Socio-economic analyses of the regions.
  - NUTS 1: major socio-economic regions
  - NUTS 2: basic regions for the application of regional policies
  - NUTS 3: as small regions for specific diagnoses
- Framing of EU regional policies.
  - Regions eligible for aid from the Structural Funds (Objective 1) have been classified at the NUTS 2 level.
  - Areas eligible under the other priority objectives have mainly been classified at the NUTS 3 level.
  - The Cohesion report has so far mainly been prepared at the NUTS 2 level.

Principles and Characteristics of NUTS

- **Principle 1**: The NUTS regulation defines minimum and maximum population thresholds for the size of the NUTS regions:

NUTS 1	3 million	7 million
NUTS 2	800 000	3 million
NUTS 3	150 000	800 000

Despite the aim of ensuring that regions of comparable size all appear at the same NUTS level, each level still contains regions which differ greatly in terms of population.

- **Principle 2**: NUTS favours administrative divisions (normative criterion)

  For practical reasons the NUTS classification is based on the administrative divisions applied in the Member States that generally comprise two main regional levels. The additional third level is created by aggregating administrative units.

- **Principle 3:** NUTS favours general geographical units

  General geographical units are normally more suitable for any given indicator than geographical units specific to certain fields of activity.

EU NUTS classification uses almost exclusively the population criterion.

[32] http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature Last update 28.07.2010

In the above explanatory texts of the EU NUTS classification, NUTS2 units are seen (to some extent) as “basic regions for the application of regional policies” while NUTS3 units are approached as “small regions for specific diagnoses”.

Regarding NUTS2 units in the case of the Western Balkans countries which have not adopted NUTS regulation, it is obvious that these countries should define “similar to NUTS2” units which are appropriate for the application of the EU regional policies (see, among others, in: Knezevic 2010). However, they would evidently apply a political criterion: the use of existing administrative divisions as they are or the limited readjustment of them or the creation of new divisions depend on the political will of these countries. Evidently, they will also take into account a relevant technical criterion: the territorial features of the existing “regions”.

Therefore, it is essential to examine if the existing administrative divisions in these countries which fulfil the population criterion for NUTS2, fulfil also the “application of regional policies” criterion. In order to better clarify this criterion, we should refer, even very concisely, to the concept of “development policy region”.

Regions can be defined by physical, “functional”, economic, social, cultural, environmental characteristics and so on; each of the many branches of territorial analysis and planning approaches regions according to its general theoretical scope. For the case of “development policy regions” in the PCC of WB most appropriate approach is to examine whether “similar NUTS2” divisions according to the NUTS populations criterion, corresponding to existing administrative divisions, comply with the “regional level” of the «spatial governance” system of each of the examined countries.

Even more, it is useful to see whether the “similar NUTS2” and “similar NUTS3” units which will be defined comply with the overall spatial configuration of the interested countries with focus on the hierarchy and the networking of the urban centres of these countries.

In next we will examine these territorial features mainly for each of the Potential CC; we will also examine this issue, relatively less, for the cases of the CC which have already adopted the EU NUTS classification.

Annex 2. Availability of data for the INTERCO selected indicators

Annex 2. Table 3.4: Availability of dta for the INTERCO headline and core indicators in the Western Balkans and Turkey

Headline and core indicators

AL: Albania, BA: Bosnia and Herzegovina, HR: Croatia, ME: Montenegro, MK: FYROM, RS: Serbia, TR: Turkey

Inidicator level	Thematic category name	Thematic sub-cat. nr	Thematic sub-category name	INTERCO Indicator name	Indicator / data name used by Eurostat and NSO	Eurostat data for HR, MK, TR: level, years			Eurostat data for AL, BH, ME, RS, XK		NSO data: level, years				
						Croatia	FYROM	Turkey	Lower available level	Availability per country	Albania	Bosnia & Herz.	Montenegro	Serbia	Kosovo
Headline	DEMOGRAPHY	2,01	Population Structure (age, sex, natural change)	Ageing index (persons 65+ / persons 0-14)	People aged 65+ (% of total population)										
				Dependency rate											
				Life expectancy at birth		NUTS2 2002-2008	NUTS2 1997-2008		NUTS0 1998-2009	AL,BA,ME,RS and XK 2003-2009					
				Life expectancy											
		2,03	Total population	Population potential within 5 km											
				Population average annual growth	Population *change*	NUTS 3, 1990-2007			NUTS 1, 1995-2009	ME,RS and XK	ME,RS and XK				
	ENERGY	4,01	Energy	Share of renewable energy in final energy consumption and increase needed to meet the 20% target											
	SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE	6,02	Education	High education population	Number of persons by educational attainment	NUTS 2, 2000-2008			NUTS 1, 1995-2009	AL,BA,ME,RS and XK					
				Share high educated population in percent											
				Population aged 30–34 with a tertiary education in 2008 and distance to Europe 2020 target (5th CR)											
				Share of tertiary educated people in %											
		6,03	Health	Healthy life expectancy (ESPON 3.2)											
		6,04	Poverty	At persistent risk of poverty rate (Population share with 60 % of the national equivalent median income)	At persistent risk of poverty rate	NUTS 2, 1997-2001			NUTS 1, 1995-2009	AL,BA,ME,RS and XK					
				Share of population living in workless or low work intensity households (5th CR)											
		6,05	Other social	Work-life balance in EU Member States (5th CR)											
		6,07	Quality of life	Happiness Index											
	ECONOMY, LABOUR FORCE	7,02	Employment, Unemployment	Difference between female and male employment rates, 20–64		NUTS2 2007-2009		NUTS2 2006-2009	NUTS0 2000-2009	AL,BA (2006-2009),ME (2007-2009),RS and XK (2001-2009)					
				Employment rate change (growth)	Employment growth	NUTS 2, 1999-2008		NUTS 2, 2006-2010							
				Unemployment rate per age: classes of 5 years											
				Development of unemployment rate (male, female, young, total, 99-04)											
		7,03	Income and Consumption	GDP per inhabitant (capita) in pps or euros, per year	GDP per inhabitant (capita) in pps or euros, per year	NUTS 3, 1995-2007			NUTS 0, 2000-2009	AL,BA,ME,RS and XK (2003-2009)		NUTS 3, 2005, 2007	NUTS 3, 2000-2004		
				GDP change per inhabitant (capita) in pps or euros	GDP change per inhabitant (capita) in pps or euros, per year	NUTS 3, 1995-2007									
				Median disposable annual household income	Median disposable annual household income	Urban Audit data for core citiies and LUZ, 1989-2006									
		7,04	Investments, Finances and Expenditures	Public sector debt relative to GDP											

Annex 2. Table 3.4: Availability of dta for the INTERCO headline and core indicators in the Western Balkans and Turkey

Headline and core indicators

AL: Albania, BA: Bosnia and Herzegovina, HR: Croatia, ME: Montenegro, MK: FYROM, RS: Serbia, TR: Turkey

Inidicator level	Thematic category name	Thematic sub-cat. nr	Thematic sub-category name	INTERCO Indicator name	Indicator / data name used by Eurostat and NSO	Eurostat data for HR, MK, TR: level, years			Eurostat data for AL, BH, ME, RS, XK		NSO data: level, years				
						Croatia	FYROM	Turkey	Lower available level	Availability per country	Albania	Bosnia & Herz.	Montenegro	Serbia	Kosovo
	ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS	8,01	Environment quality	NATURA 2000 area (Share of Natura 2000 area in %) (5th C.R.)											
		8,02	Natural assets	Consumption of water per capita											
	NON - CROSS-THEMATIC DATA	99,01	Integrative indices and typologies	Intensity of multiple risks (number of challenges) for European Regions ("Regions 2020")											
	GOVERNANCE	9,01	Governance	Electoral participation											
				WGI Index on voice and accountability											
Core	DEMOGRAPHY	2,03	Total population	Population density	Population density	NUTS3,1990-2008			NUTS 0, 2000-2009	AL,BA,ME,RS and XK (2003-2009)					
		2,04	Urban - rural population	Urban - rural population in Europe based on national classification	Urban - rural population in Europe based on national classification	Urban Audit data for core citiies and LUZ, 1989-2006									
	TRANSPORT, ACCESSIBILITY, COMMUNICATION	3,03	Accessibility	Potential accessibility to GDP by road											
				Potential accessibility to population by road											
				Time to the nearest motorway access											
				Travel time to railway stations											
	ENERGY	4,01	Energy	Energy intensity of the economy											
				Renewable energy consumption											
	SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE	6,02	Education	Early school leavers and distance to Europe 2020 target - 5th CR	Early school leavers	NUTS0 2002-2010	NUTS0 2006-2010	NUTS0 NUTS1 2006 - 2010	NUTS0	RS (2004-2009), XK (2004-2009)					
		6,03	Health	Health expenditure per capita	Health expenditure per capita				NUTS 0, 2000-2008	AL, RS (2001-2008)					
				Expenditure on health as part of GDP (national level)											
		6,04	Poverty	Number of homeless people as a proportion of total resident population											
				Population suffering from severe material deprivation (% of total population) (5th CR)											
		6,07	Quality of life	Happiness and GDP per head (5th CR)											
				Homicide rate (5th CR)											
	ECONOMY, LABOUR FORCE	7,01	Labour force	Labour productivity, gross domestic product as PPP per person employed	Labour productivity	NUTS 2, 2000-2009									
		7,02	Employment, Unemployment	Employment rate change %, 20–64 years, in certain time period and distance to Europe 2020 target											
				% of households having broadband access	% of households having broadband access	NUTS 2, 2006-2009			NUTS0	RS (2004-2008), XK (2001-2008)					

Annex 2. Table 3.4: Availability of dta for the INTERCO headline and core indicators in the Western Balkans and Turkey

Headline and core indicators

AL: Albania, BA: Bosnia and Herzegovina, HR: Croatia, ME: Montenegro, MK: FYROM, RS: Serbia, TR: Turkey

Inidicator level	Thematic category name	Thematic sub-cat. nr	Thematic sub-category name	INTERCO Indicator name	Indicator / data name used by Eurostat and NSO	Eurostat data for HR, MK, TR: level, years			Eurostat data for AL, BH, ME, RS, XK		NSO data: level, years				
						Croatia	FYROM	Turkey	Lower available level	Availability per country	Albania	Bosnia & Herz.	Montenegro	Serbia	Kosovo
		7,07	Innovation	Human Resources in Science and Technology (core) (5th CR)	Human Resources in Science and Technology	NUTS 2, 1995-2008									
				GERD (Gross domestic expenditure on research and development)	GERD (Gross domestic expenditure on research and development)	NUTS 2, 1998-2008									
	ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS	8,01	Environment quality	Residence density											
				Urban waste water treatment capacity (5th C.R.) - 1st priority											
		8,02	Natural assets	Share of areas with high ecological value											
				Dwellings connected to potable water system											
				% of green space per inhabitant											
		8,03	Climate change	Greenhouse gas emission		NUTS 1, 1995-2009				AL (NUTS0-2006), ME (NUTS0-2007)					
	GOVERNANCE	9,01	Governance	Trust in the legal system (Share of persons having complete trust/ no trust at all in the legal system of a country)											
	TERRITORIAL STRUCTURE	10,01	Urban structure	MEGA / Metropolitan European Growth Areas											

Annex 2. Table 3.5: Availability of dta for the INTERCO headline and core indicators in the Western Balkans and Turkey
Final indicators
AL: Albania, BA: Bosnia and Herzegovina, HR: Croatia, ME: Montenegro, MK: FYROM, RS: Serbia, TR: Turkey

Territorial objectives	INTERCO Indicator name	Indicator / data name used by Eurostat and NSO	Eurostat data for HR, MK, TR: level, years			Eurostat data for AL, BH, ME, RS, XK		NSO data: level, years				
			Croatia	FYROM	Turkey	Lower available level	Availability per country	Albania	Bosnia & Herz.	Montenegro	Serbia	Kosovo
Strong local economies ensuring global competitiveness	Labour productivity in industry and services		NUTS 2, 2000-2009									
	GDP per capita in PPP		NUTS 3, 1995-2007			NUTS 0, 2000-2009	AL,BA,ME,RS and XK (2003-2009)		2005, 2007	2000-2004		
	Overall unemployment rate		NUTS2 2007-2010	NUTS0 2000-2009	NUTS2 2006-2010	NUTS0 2000-2009	AL,BA,ME,RS and XK					
	Old age dependency ratio		NUTS0 2001-2011	NUTS0 1995-2011	NUTS0 1995-2011							
Innovative territories	Population aged 25-64 with tertiary education	Share of tertiary educated people in %	NUTS2 2008-2010	NUTS2 2008-2011	NUTS2 2008-2012	NUTS0 1998-2009	AL, RS					
	Intramural expenditures on R&D											
	Employment rate 20-64		NUTS 2, 2007-2010		NUTS 2, 2006-2010							
Fair access to services, market and jobs	Access to compulsory school											
	Access to hospitals											
	Accessibility of grocery services											
	Access to university											
	Accessibility potential by road											
	Accessibility potential by rail											
	Accessibility potential by air											
Inclusion and quality of life	Disposable household income	Median disposable annual household income	Urban Audit data for core cities and LUZ, 1989-2006									
	Life expectancy at birh		NUTS1 NUTS2 2002-2008	NUTS1 NUTS2 1997-2008		NUTS0 1998-2009	AL,BA,ME,RS and XK 2003-2009					
	Proportion of early school leavers		NUTS0 2002-2010	NUTS0 2006-2010	NUTS0 NUTS1 2006 - 2010	NUTS0	RS (2004-2009), XK (2004-2009)					
	Gender imbalances											
	Different female-male unemployment rate		NUTS2 2007-2009		NUTS2 2006-2009	NUTS0 2000-2009	AL,BA (2006-2009),ME (2007-2009),RS and XK (2001-2009)					
	Ageing index		NUTS2 2002-2009	NUTS2 2003-2009	NUTS2 2008-2009	NUTS0 1998-2009	AL,BA,ME,RS and XK 2003-2009					
Attractive regions of high ecological values and strong territorial capital	Potential vulnerability to climate change (ESPON Climate)											
	Air pollution: PM10											
	Air pollution: Ozone concentrations	Total greenhouse gas emissions (CO2 equivalent (1990=100))	NUTS0 2000-2008		NUTS0 2000-2008		AL (NUTS0-2006), ME (NUTS0-2007)					
	Soil sealing per capita											
Integrated polycentric territorial development	Population potential within 50 km											
	Net migration rate		NUTS0 2000-2009	NUTS0 2000-2008								
	Cooperation intensity (number of common projects between partners)											
	Cooperation degree (the number of regions cooperating with each other)											

Annex 9. ESPON INTERCO GIS Tools and Database CD-ROM/DVD

Structure of the CD-ROM/DVD

The overall output of all GIS works of INTERO will be made available on CD-ROM/DVD, which accompanies the INTERCO Final Report. The CD-ROM/DVD will store the user manual, all produced maps, the indicators themselves, as well as their input data and the tools to calculate or process them.

All this will be made available on the CD-ROM/DVD in a comprehensive folder structure. The available folders are:

CARTO folder storing all generated MXD files for indicator mapping

DOC folder storing the metadata documentation and the user manual

EXCEL collection of Excel files in the ESPON format providing data on selected territorial cohesion indicators

LYRS collection of layers files for mapping (referenced in MXD files)

MAPS collections of all produced maps in PNG and Adobe Illustrator file formats, exported from ArcGIS

TOOLS folder storing the INTERCO toolbox and the developed scripts

The generated INTERCOD GIS Database (INTERCO_DB) is stored in parallel to these sub-directories.

Installation

To use this database, no specific installation routine is required. Just copy the files onto hard disc, create a new or use an already existing workspace or folders. After copying, the database, map files and tools are immediately ready to process.

Prerequisites

Working with the Personal Geodatabase of INTERCO, with the map template files, the layer files, or with the INTERCO toolbox requires ESRI´s ArcGIS software, version 9.x or 10. The data files under the **EXCEL** directory can be opened with MS Office 2007 software. The produced maps stored in the **MAPS** folder can be opened with any drawing software, or with the Windows built-in picture viewers.

INTERCO
Indicators of territorial cohesion

Scientific Platform and Tools Project 2013/3/2

Final Report

Annex 10
Indicator metadata

Version 14 Sep. 2012

EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

This report presents the final results of a “Scientific Platform and Tools” Project conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

Information on the ESPON Programme and projects can be found on www.espon.eu

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This basic report exists only in an electronic version.

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- Carsten SCHÜRMANN

This annex provides metadata information for the selected territorial cohesion indicators according to the ToR of ESPON INTERCO. The metadata are provided indicator-by-indicator, with one table per indicator. The order of the indicator metadata follows the order of the indicator presentation (see Scientific Report, Section C.3. Indicators presentation"). Each selected territorial cohesion indicator is presented in one page following this template:

Aspect	Description
Indicator name	Name of the indicator as used in the report
Theme	ESPON DB category and sub-category to which it belongs : Category / Sub-category
Policy objective	Territorial objective as developed by INTERCO To what extent it covers this territorial objective.
Core indicator	Describes if the indicator is proposed as a core indicator of territorial cohesion: Yes or No Note : A “No” was given to the indicators with sub-optimal data availability. This classificaiton as “Core” is different from the INTERCO headline/core/analytical classification presented in Annex 2, which was used for prioritising the indicators during the selection process.
Type of indicator	Describes if the indicator is simple or composite, qualitative or quantitative, dynamic or static, as well as its level of measurement (ratio, stock, normalised scale, etc.)
Methodology	The variables used and how they were combined.
Quality	Assessment of robustness and pertinence of the indicator.
Availability	For which year and countries or regions the indicator is available.
Frequency	How often it can be updated, how often it would be interesting to update it.
Improvements	How the indicator could be improved.
Geographic levels	At which levels it can be calculated.
Author	Person and/or organisation who created the indicator.

Even though these metadata are also part of the indicator Excel files, this Annex report provides an easy and comprehensive synthesis of the metadata without having to open all the individual Excel files.

Aspect	Description
Indicator name	GDP per capita
Theme	Economy, labour force / business, all sectors
Policy objective	Strong local economies ensuring global competitiveness. The indicator provides insight into economic strength and regional growth.
Core indicator	Yes
Type of indicator	Simple, quantitative, dynamic indicator, ratio
Methodology	Indicator used as provided by Eurostat
Quality	Generally good quality and good spatial coverage as well as good temporal availability.
Availability	Available annually for the period 2001-2010; available for EU27, Iceland and Macedonia, partly for Turkey and Switzerland only available at national levels. Regional data for Norway only for 2007 (exclusing offshore activities). Regional data for Switzerland cannot be provided by Statistics Switzerland.
Frequency	Annual updates; annual updates required from the point of view of territorial cohesion in order to analyse temporal dimension of territorial cohesion (sigma and beta convergences).
Improvements	Extend coverage at NUTS-3 level for Switzerland, Turkey and Western Balkans.
Geographic levels	Indicator available at NUTS-3 level and higher; highest relevance for territorial cohesion at NUTS-3 level
Author	Eurostat Regio Database

Aspect	Description
Indicator name	Unemployment rate
Theme	Economy, labour force / employment, unemployment.
Policy objective	Strong local economies ensuring global competitiveness This indicator measures the quality and performance of regional labour markets. It constitutes a contextual indicator important to assess regional flexibility as well as sustainability of local economic activities.
Core indicator	Yes
Type of indicator	Simple, quantitative, dynamic indicator, ratio
Methodology	Indicator used as provided by Eurostat
Quality	Generally good quality and good spatial coverage as well as good temporal availability.
Availability	Available annually for the period 1999-2009; available for EU27, Iceland, Norway, Switzerland and Turkey
Frequency	annual updates; annual updates required from the point of view of territorial cohesion in order to analyse temporal dimension of territorial cohesion (sigma and beta convergences).
Improvements	Extend coverage at NUTS-3 level for Western Balkans and French Overseas Departments.
Geographic levels	Indicator available at NUTS-3 level and higher; highest relevance for territorial cohesion at NUTS-3 level
Author	Eurostat Regio Database

Aspect	Description
Indicator name	Old-age dependency ratio
Theme	Demography / population structure
Policy objective	Strong local economies ensuring global competitiveness This indicator warns about overaging of population that may lead to severe problems in pension systems and also to social disruptions, affecting sustainability of local economies.
Core indicator	Yes
Type of indicator	Simple, quantitative, dynamic indicator, ratio
Methodology	Indicator defined as the ratio of the population aged 64 or above divided by the population aged 15-64, multiplied with 100.
Quality	Generally good quality and good spatial coverage as well as good temporal availability. Input data on population by age groups not available for United Kingdom and Western Balkans.
Availability	Available annually for the period 2000-2010; available for EU27, Iceland, Norway, Switzerland and Turkey, except for UK and Western Balkans; data gaps for some regions for some years.
Frequency	annual updates; annual updates required from the point of view of territorial cohesion in order to analyse temporal dimension of territorial cohesion (sigma and beta convergences).
Improvements	Extend coverage at NUTS-3 level for UK, Western Balkans and French Overseas Departments.
Geographic levels	Indicator available at NUTS-3 level and higher; highest relevance for territorial cohesion at NUTS-3 level
Author	Carsten Schürmann (RRG), ESPON INTERCO. Input data on population by age groups taken from Eurostat Regio Database.

Aspect	Description
Indicator name	Labour productivity, overall
Theme	Economy, labour force / labour force
Policy objective	Strong local economies ensuring global competitiveness. This indicator tells us the robustness of GDP produced and shows the competitiveness of a region in global economies.
Core indicator	No
Type of indicator	composite, quantitative, dynamic indicator, ratio
Methodology	Indicator defined as GDP in PPS per person employed relative to EU27 average.
Quality	Good spatial coverage and temporal availability, however, missing spatial disaggregation does not allow to analyse spatial disparities. Explanatory power at national level is limited. This indicator was only used as proxy indicator because the alternative indicator on labour productivity in industry and services is not available as timer-series.
Availability	Available annually for the period 1995-2010; available for EU27, Iceland, Norway, Switzerland and Turkey. Data missing for Western Balkans.
Frequency	annual updates; annual updates required from the point of view of territorial cohesion in order to analyse temporal dimension of territorial cohesion (sigma and beta convergences).
Improvements	Disaggregation to regional level such as NUTS-3 is required in order to analyse spatial disparities.
Geographic levels	Indicator available at national level (NUTS-0); even though national level not useful to analyse territorial cohesion, so far no better time-series indicator on labour productivity is available.
Author	Eurostat Regio Database

Aspect	Description
Indicator name	Labour productivity in industry and services
Theme	Economy, labour force / labour force
Policy objective	Strong local economies ensuring global competitiveness. This indicator tells us the robustness of GDP produced and shows the competitiveness of a region in global economies.
Core indicator	No
Type of indicator	composite, quantitative, ratio
Methodology	Indicator defined as GVA per person employed in industry and services relative to EU27 average.
Quality	Fairly good quality and coverage at NUTS-2 level, even though ESPON space is not fully covered.
Availability	Available only for 2007; available for entire ESPON space, except for Iceland, Norway, Switzerland, Turkey and Western Balkans.
Frequency	Available only for 2007, no time series; annual time series data would be extremely interesting to analyse with view on the temporal development of territorial cohesion (sigma and beta convergences).
Improvements	Generation of time series and if possible further disaggregation to NUTS-3 level.
Geographic levels	Indicator available at NUTS-2 level
Author	Eurostat, DG Regio 5th Cohesion Report

Aspect	Description
Indicator name	Population aged 25-64 with tertiary education
Theme	Social and cultural affairs, quality of life / education
Policy objective	Innovative territories. This indicator measures the highly-qualified labour force as basis for future R&D activities. Human capital is an essential factor for innovation potential.
Core indicator	Yes
Type of indicator	composite, quantitative, dynamic indicator, ratio
Methodology	Indicator used as taken from Eurostat. Indicator defined as population aged 25-64 with tertiary education as percentage of all population aged 25-64.
Quality	Fairly good quality and coverage at NUTS-2 level, even though ESPON space is not fully covered.
Availability	Available basically for ESPON space except for Luxembourg, Liechtenstein and Baltic States. Data also missing for Western Balkans and French Overseas Departments.
Frequency	Available annually for recent past for period 2008-2010
Improvements	Indicator should be available for longer timer periods, allowing keeping track of evolution across longer time span. If possible indicator to be collected at NUTS-3 level, allowing an even finer spatial analysis including a differentiation by type of region. Extend spatial coverage to cover Baltic States and Western Balkans and French Overseas Departments.
Geographic levels	Indicator available at NUTS-2 level
Author	Eurostat Regio Database, Statistics Iceland, Statistical Service Cyprus.

Aspect	Description
Indicator name	Total intramural R&D expenditures
Theme	Economy, labour force / innovation
Policy objective	Innovative territories. This indicator measures the future orientation of the regional economy in terms of investments in R&D, determinant for innovation capacity and future regional prosperity.
Core indicator	Yes
Type of indicator	composite, quantitative, ratio
Methodology	Indicator defined as total intramural R&D expenditures at universities or at other public research institutes, in percent of GDP.
Quality	Fairly good quality and coverage at NUTS-2 level, even though ESPON space is not fully covered. Existing data reveal quite interesting insights.
Availability	Available basically for ESPON space except for Belgium, Iceland, Liechtenstein, Norway, Switzerland, Turkey and Western Balkans.
Frequency	Available only for 2007, so far no time series.
Improvements	Indicator should be collected as time series indicator for longer periods to allow analysis of spatial dimension of territorial cohesion. Data gaps for said countries should be closed. If possible data disaggregation at NUTS-3 level appreciated.
Geographic levels	Indicator available at NUTS-2 level
Author	Eurostat, EC 5th Cohesion Report

Aspect	Description
Indicator name	Employment rate 20-64
Theme	Economy, labour force / employment, unemployment
Policy objective	Innovative territories. This indicator measures the actual participation of working age population in economic regional activities and in producing net added value. High employment rates reflect quality of labour market which constitutes a favourable context for innovative territories.
Core indicator	Yes
Type of indicator	simple, quantitative, dynamic indicator, ratio
Methodology	Indicator used as taken from Eurostat. Indicator defined as percentage of people employed aged 20-64 on all people aged 20-64
Quality	Very good data quality at NUTS-2 level with sufficient temporal dimension.
Availability	Available for entire ESPON space. Data missing only for Western Balkans.
Frequency	Available as time series for 1999-2009
Improvements	Indicator should be made available for Western Balkans. Disaggregation to NUTS-3 level would be appreciated to further analyse spatial disparities at regional level by type of region.
Geographic levels	Indicator available at NUTS-2 level
Author	Eurostat Regio Database

Aspect	Description
Indicator name	Access to compulsory schools
Theme	Transport, accessibility, communication / accessibility
Policy objective	Fair access to services, markets and jobs. This indicator measures fair access to basic education as a basic public service.
Core indicator	No
Type of indicator	quantitative, results of field survey, ratio
Methodology	Indicator defined as the percent of population experiencing difficulties in access to compulsory schools as results of a representative SILC survey.
Quality	Data situation poor. Indicator only taken as proxy since currently no better alternative European-wide data source existing which models or provides information on access to schools.
Availability	Available for EU27 only. Data missing for other European countries.
Frequency	Available only for 2008; since access to schools will not significantly change annually, the indicator should be made available in 5-year increments.
Improvements	Either, SILC survey results should be made available at NUTS-3 level, or the survey indicator could be replaced by modeled accessibility indicators such as "percent of regional population with more than X minutes travel time to next compulsory school", derived through GIS analyses. Such indicators are being calculated in ESPON TRACC for selected case study regions. Furthermore, the indicator should be calculated as time series with 5-year increments.
Geographic levels	Basically at national level, subdivided by degree of urbanisation (regions where interviewees reside classified as urban, intermediate or rural regions)
Author	Eurostat SILC survey, EC 5th Cohesion Report

Aspect	Description
Indicator name	Access to hospitals
Theme	Transport, accessibility, communication / accessibility
Policy objective	Fair access to services, markets and jobs. This indicator measures fair access to health care as a basic public service.
Core indicator	No
Type of indicator	quantitative, results of field survey, ratio
Methodology	Indicator defined as the percent of population experiencing difficulties in access to primary health care services as results of a representative SILC survey.
Quality	Data situation poor. Indicator only taken as proxy since currently no better alternative European-wide data source existing which models or provides information on access to hospitals.
Availability	Available for EU27 only. Data missing for other European countries.
Frequency	Available only for 2008; since access to hospitals will not significantly change annually, the indicator should be made available in 5-year increments.
Improvements	Either, SILC survey results should be made available at NUTS-3 level, or the survey indicator could be replaced by modeled accessibility indicators such as “percent of regional population with more than X minutes travel time to next hospital”, derived through GIS analyses. Similar indicators are being calculated in ESPON TRACC for selected case study regions (access to basic health care facilities). Furthermore, the indicator should be calculated as time series with 5-year increments.
Geographic levels	Basically at national level, subdivided by degree of urbanisation (regions where interviewees reside classified as urban, intermediate or rural regions)
Author	Eurostat SILC survey, EC 5th Cohesion Report

Aspect	Description
Indicator name	Accessibility potential by road
Theme	Transport, accessibility, communication / accessibility
Policy objective	Fair access to services, markets and jobs. This indicator measures market potential and locational advantages of a region.
Core indicator	Yes
Type of indicator	Composite, quantitative, dynamic indicator, normalised
Methodology	Composite indicator calculated by accessibility model by using transport networks and population figures as input. Indicator defined as the reachable population weighted by time distance by using cars. Indicator standardised at European average.
Quality	Very good data quality, very good spatial coverage
Availability	Available for EU27, Iceland, Norway and Switzerland. Data missing for Turkey and Western Balkans.
Frequency	Available so far for 2001 and 2006; ESPON TRACC will update the indicator to 2011. Since accessibility potential is unlikely to change significantly annually, the indicator should be made available in 5-year increments.
Improvements	Indicator will be updated to 2011 by ESPON TRACC project, including geographical extensions to the missing countries. Indicator should be calculated beyond 2011 in five-year intervals.
Geographic levels	Available NUTS-3 level, perfectly fine to analyse territorial cohesion
Author	Klaus Spiekermann, Spiekermann&Wegener (S&W), ESPON DB

Aspect	Description
Indicator name	Accessibility potential by rail
Theme	Transport, accessibility, communication / accessibility
Policy objective	Fair access to services, markets and jobs. This indicator measures market potential and locational advantages of a region.
Core indicator	Yes
Type of indicator	Composite, quantitative, dynamic indicator, normalised
Methodology	Composite indicator calculated by accessibility model by using transport networks and population figures as input. Indicator defined as the reachable population weighted by time distance by using railways. Indicator standardised at European average.
Quality	Very good data quality, very good spatial coverage
Availability	Available for EU27, Iceland, Norway and Switzerland. Data missing for Turkey and Western Balkans.
Frequency	Available so far for 2001 and 2006; ESPON TRACC will update the indicator to 2011. Since accessibility potential is unlikely to change significantly annually, the indicator should be made available in 5-year increments.
Improvements	Indicator will be updated to 2011 by ESPON TRACC project, including geographical extensions to the missing countries. Indicator should be calculated beyond 2011 in five-year intervals.
Geographic levels	Available NUTS-3 level, perfectly fine to analyse territorial cohesion
Author	Klaus Spiekermann, Spiekermann&Wegener (S&W), ESPON DB

Aspect	Description
Indicator name	Accessibility potential by air
Theme	Transport, accessibility, communication / accessibility
Policy objective	Fair access to services, markets and jobs. This indicator measures market potential and locational advantages of a region.
Core indicator	Yes
Type of indicator	Composite, quantitative, dynamic indicator, normalised
Methodology	Composite indicator calculated by accessibility model by using transport networks and population figures as input. Indicator defined as the reachable population weighted by time distance by flights. Indicator standardised at European average.
Quality	Very good data quality, very good spatial coverage
Availability	Available for EU27, Iceland, Norway and Switzerland. Data missing for Turkey and Western Balkans.
Frequency	Available so far for 2001 and 2006; ESPON TRACC will update the indicator to 2011. Since accessibility potential is unlikely to change significantly annually, the indicator should be made available in 5-year increments.
Improvements	Indicator will be updated to 2011 by ESPON TRACC project, including geographical extensions to the missing countries. Indicator should be calculated beyond 2011 in five-year intervals.
Geographic levels	Available NUTS-3 level, perfectly fine to analyse territorial cohesion
Author	Klaus Spiekermann, Spiekermann&Wegener (S&W), ESPON DB

Aspect	Description
Indicator name	Disposable household income
Theme	Economy, labour force / income and consumption
Policy objective	Inclusion and Quality of Life. This indicator measures the welfare of residence population in a region and reflect the level of poverty.
Core indicator	Yes
Type of indicator	Simple, quantitative, dynamic indicator, stock numbers
Methodology	Indicator used as taken from Eurostat. Simple indicator expressed in Euro.
Quality	Very good data availability at NUTS-2 level; explanatory power would be even higher if data at NUTS-3 level would be available.
Availability	Available for EU27. Data missing for Liechtenstein, Luxembourg, Malta, Switzerland, Turkey and Western Balkans.
Frequency	Available annually for time period 1996-2007. Annual data appreciate to keep track of small changes over time.
Improvements	Further disaggregation towards NUTS-3 and extension of spatial coverage towards missing countries.
Geographic levels	Currently available NUTS-2 level, from a territorial perspective a further disaggregation to NUTS-3 level would be appreciated since many NUTS-2 regions comprise both urban centres and rural surroundings which are unlikely to have the same levels of household income.
Author	Eurostat Regio Database, Statistics Iceland, Statistical Service Cyprus

Aspect	Description
Indicator name	Life expectancy at birth
Theme	Social and cultural affairs, quality of life / health
Policy objective	Inclusion and Quality of Life. This indicator represents a proxy for the overall quality of the health-care system in a region. It tells us about healthiness of living environment and together with ageing index it allows to assess social policies projections and risk of exclusion.
Core indicator	Yes
Type of indicator	Simple, quantitative, dynamic indicator, stock numbers
Methodology	Indicator used as taken from Eurostat. Simple indicator expressing the average life expectancy at birth for both women and men in years.
Quality	Very good data availability at NUTS-2 level; explanatory power would be even higher if data at NUTS-3 level would be available.
Availability	Available for entire ESPON space. Data missing for Turkey and Western Balkans.
Frequency	Available annually for time period 2000-2008. Annual data appreciated to keep track of small changes over time.
Improvements	Further disaggregation towards NUTS-3 and extension of spatial coverage towards missing countries.
Geographic levels	Currently available NUTS-2 level, from a territorial perspective a further disaggregation to NUTS-3 level would be appreciated.
Author	Eurostat Regio Database

Aspect	Description
Indicator name	Proportion of early school leavers
Theme	Social and cultural affairs, quality of life / education
Policy objective	Inclusion and Quality of Life. This indicator measures the quality of the school system and potential inclusion in labour market.
Core indicator	Yes
Type of indicator	Simple, quantitative, dynamic indicator, ratio
Methodology	Indicator used as taken from Eurostat. Simple indicator defined as the proportion of early school leavers from education and training.
Quality	Generally poor data quality due to the large data gaps for individual regions and years. Almost no complete data set for any year. Also availability at NUTS-1 level is reducing explanatory power.
Availability	Basically available for entire ESPON space, plus Croatia and Turkey. Data missing for Baltic States, Iceland, Liechtenstein and Western Balkans; however, there are many data gaps at regional level for individual years preventing from performing comprehensive time series analysis.
Frequency	Available annually for time period 2000-2010. Annual data appreciated to keep track of small changes over time.
Improvements	Further disaggregation towards NUTS-3 and extension of spatial coverage towards missing countries, and filling data gaps.
Geographic levels	Currently available NUTS-1 level only. A further disaggregation towards NUTS-3 level is required.
Author	Eurostat Regio Database, Statistical Service Cyprus

Aspect	Description
Indicator name	Gender imbalances
Theme	Demography / population structure
Policy objective	Inclusion and Quality of Life. This indicator measures differences in the gender composition of a society. A balanced participation of men and women in activities is determinant for an inclusive society.
Core indicator	Yes
Type of indicator	composite, quantitative, dynamic indicator, ratio
Methodology	Indicator defined as the ratio of female/male population, calculated based upon data on population by sex provided by Eurostat Regio Database.
Quality	Good data quality in both temporal and spatial dimension.
Availability	Data available for entire ESPON space and Turkey. Data missing for Western Balkans.
Frequency	Available as time series for 2000-2009. Even though indicator is only gradually changing over time, annual data availability is important to keep track of these small changes.
Improvements	No general improvements needed, except to extend the geographical coverage towards Western Balkans.
Geographic levels	Available at NUTS-3 level.
Author	Carsten Schürmann (RRG), ESPON INTERCO, based upon input data on population by sex provided by Eurostat.

Aspect	Description
Indicator name	Differences in female-male unemployment rates
Theme	Economy, labour force / employment, unemployment
Policy objective	Inclusion and Quality of Life. This indicator measures the female participation in economy, and thus the overall quality of labour markets of an inclusive society.
Core indicator	Yes
Type of indicator	composite, quantitative, dynamic indicator
Methodology	Indicator defined as the difference in the female and male unemployment rates (female rate minus male rate). Input data on unemployment rates by sex taken from Eurostat Regio Database.
Quality	Good data quality in both temporal and spatial dimension, though explanatory power in light of territorial cohesion would be even bigger if data would be available at NUTS-3 level.
Availability	Data available for entire ESPON space and Turkey. Data missing for Western Balkans.
Frequency	Available as time series for 1999-2010. Even though indicator is only gradually changing over time, annual data availability is important to keep track of these small changes.
Improvements	No general improvements needed, except to extend the geographical coverage towards Western Balkans.
Geographic levels	Available at NUTS-2 level.
Author	Carsten Schürmann (RRG), ESPON INTERCO

Aspect	Description
Indicator name	Ageing index
Theme	Demography / population structure
Policy objective	Inclusion and Quality of Life. This indicator measures the balance of the age structure of the society.
Core indicator	Yes
Type of indicator	composite, quantitative, dynamic indicator, ratio
Methodology	Indicator defined as the ratio of the population aged 64 and above divided by population of 15 years and below. Input data on population age structure taken from Eurostat Regio Database.
Quality	Good data quality in both temporal and spatial dimensions, despite data gaps for UK and Western Balkan.
Availability	Data available for entire ESPON space and Turkey. Data missing for the UK and Western Balkans.
Frequency	Available as time series for 2000-2010. Even though indicator is only gradually changing over time, annual data availability is important to keep track of these small changes.
Improvements	No general improvements needed, except to extend the geographical coverage towards the UK and Western Balkans.
Geographic levels	Available at NUTS-3 level.
Author	Carsten Schürmann (RRG), ESPON INTERCO; input data on population by age structure provided by Eurostat.

Aspect	Description
Indicator name	Potential vulnerabiltiy to climate change
Theme	Environment quality, natural assess, hazards / climate change
Policy objective	Attractive regions of high ecological values and strong territorial capital. This indicator measures the overall vulnerability of regions in Europe to climate change, accounting for the sensitivity and adaptation capacities of regions and their regional/local government preparedness to adapt to climate change when confronted to cases of extreme climatic events. Potential vulnerability to climate change should be reduced, especially the socioeconomic sensitivity to exposure to extreme climatic events by rising GDP, preparedness and caring system.
Core indicator	Yes
Type of indicator	Composite, quantitative
Methodology	Composite indicator as a combination of eight climatic variables
Quality	Fairly good, however, with significant gaps.
Availability	Available at NUTS-3 only for 2011, no temporal dynamics; available for EU27, but data missing for Switzerland, Cyprus, Iceland, Liechtenstein, Malta, Turkey, Western Balkans and the outermost regions.
Frequency	No updates foreseen.
Improvements	Extend coverage to completely cover ESPON space; think of temporal dimension (i.e. how to update this indicator)
Geographic levels	Indicator available at NUTS-3 level and higher; highest relevance for territorial cohesion at NUTS-3 level
Author	ESPON Climate

Aspect	Description
Indicator name	Air pollution: PM10
Theme	Environment quality, natural assets, hazards / environment quality
Policy objective	Attractive regions of high ecological values and strong territorial capital. The indicator tries measuring the degree of reductions in emissions for healthier natural living environments.
Core indicator	Yes
Type of indicator	composite, quantitative, dynamic indicator
Methodology	Indicator defined as yearly average PM10 concentration at surface level in yg/m3, weighed by population.
Quality	Even though there is a good spatial coverage for 2009, results show that indicator is modeled since many neighbouring NUTS-3 regions have same levels.
Availability	Data available for EU27. Data missing for Iceland, Liechtenstein, Norway, Switzerland, Turkey and Western Balkans and French Overseas Departments.
Frequency	Available for 2009 only. No time series so far, which would be needed to analyse the temporal development.
Improvements	So far indicator is modeled; modeling could be replaced by real measurement stations. Time series needed to analyse development over time.
Geographic levels	Available at NUTS-3 level.
Author	EC 5th Cohesion Report, JRC, EFGS

Aspect	Description
Indicator name	Air pollution: Ozone concentration
Theme	Environment quality, natural assets, hazards / environment quality
Policy objective	Attractive regions of high ecological values and strong territorial capital. The indicator tries measuring the degree of reductions in emissions for healthier natural living environments.
Core indicator	Yes
Type of indicator	composite, quantitative, dynamic indicator
Methodology	Indicator defined as the number of days with ground level concentration exceedances of more than 120 yg/m3.
Quality	Even though there is a good spatial coverage for 2009, results show that indicator is modeled since many neighboring NUTS-3 regions have same levels.
Availability	Data available for EU27. Data missing for Iceland, Norway, Switzerland, Turkey and Western Balkans and French Overseas Departments.
Frequency	Available for 2008 only. No time series so far, which would be needed to analyze the temporal development.
Improvements	So far indicator is modeled; modeling could be replaced by real measurement stations. Time series needed to analyze development over time.
Geographic levels	Available at NUTS-3 level.
Author	EC 5th Cohesion Report, JRC, EFGS

Aspect	Description
Indicator name	Soil sealing per capita
Theme	Environment quality, natural assets, hazards / climate change
Policy objective	Attractive regions of high ecological values and strong territorial capital. This indicator measures the degree of de-coupling of economic / demographic development and land take.
Core indicator	Yes
Type of indicator	composite, quantitative, dynamic indicator
Methodology	Indicator defined as the annual soil sealing per inhabitant in sqm through land take.
Quality	Data quality for 2006 generally good, but time series is missing which is a prerequisite for looking into the temporal dimension of cohesion. Indicator results are, however, sometimes difficult to interpret since the indicator is a function of both the actual land take, the size of the region and the number of inhabitants, resulting in rather low figures in agglomerations and sometimes very high figures in sparsely populated areas.
Availability	Data available for EU27. Data missing for Iceland, Liechtenstein, Norway, Switzerland, Turkey and Western Balkans.
Frequency	Available for 2006 only. No time series so far, which would be needed to analyse the temporal development.
Improvements	So far indicator is modeled based upon satellite imageries. Modelling could be replaced by data from statistics, which may be more precise. Time series needed to analyze development over time.
Geographic levels	Available at NUTS-3 level.
Author	EC 5th Cohesion Report, EEA, Eurostat

Aspect	Description
Indicator name	Population potential within 50 km
Theme	Territorial structure / regional, territorial structure
Policy objective	Integrated polycentric territorial development. This indicator is a proxy for demand for provision of services, for market potential and for polycentricity.
Core indicator	Yes
Type of indicator	composite, quantitative, dynamic indicator, normalised
Methodology	Indicator defined as the population within 50 km airline distance, calculated at 2.5 x 2.5 raster system and then aggregated and standardised to NUTS-3 regions as weighted averages.
Quality	Data quality is very good. Availability of raster level allows for aggregation to various LAU and NUTS levels, and for flexibility in different forms of analyses.
Availability	Data available for EU27. Data missing for Iceland, Norway, Switzerland, Turkey and Western Balkans.
Frequency	Available for 2008 only. No time series so far, which would be needed to analyse the temporal development. Since indicator will only change slowly, five-year intervals would be sufficient to capture the temporal dimension.
Improvements	Indicator should be extended to the missing countries, and should be calculated in 5-year increments to allow for construction of time series. ESPON could strive to establish a raster population database, allowing flexibility in the establishment of such indicators.
Geographic levels	Available at 2.5x2.5 km raster level, NUTS-3 level and at combined NUTS-2/3 level.
Author	Carsten Schürmann (RRG), ESPON INTERCO

Aspect	Description
Indicator name	Net migration rate
Theme	Demography / migration
Policy objective	Integrated polycentric territorial development. It measures attractiveness and trends of concentration within European territory.
Core indicator	Yes
Type of indicator	composite, quantitative, dynamic indicator, rate
Methodology	Indicator defined as the long time annual average of net migrants per thousand inhabitants.
Quality	Data quality is good. NUTS-3 results show interesting disparities and differences.
Availability	Data available for EU27. Data missing for Iceland, Liechtenstein, Norway, Turkey and Western Balkans and French Overseas Departments.
Frequency	Available for 2007 only. No time series so far, which would be needed to analyse the temporal development.
Improvements	Indicator should be extended to the missing countries, and should be calculated regularly to keep track of migration processes in Europe. A full matrix of (annual) migration flows would even increase possibilities for analyses.
Geographic levels	Available at NUTS-3 level
Author	ESPON DB, 5th Cohesion Report, Statistics Switzerland

Aspect	Description
Indicator name	Cooperation intensity
Theme	Governance
Policy objective	Integrated polycentric territorial development. Cooperation and coordination can reinforce territorial integration.
Core indicator	Yes
Type of indicator	simple, quantitative, dynamic indicator, rate
Methodology	Indicator defined as the number of INTERREG projects per 100,000 inhabitants.
Quality	Data quality is good. NUTS-2 results show interesting disparities and remarkable differences.
Availability	Data available for EU27. Data missing for Turkey and Western Balkans, but there are also gaps for some regions in EU27 (for instance in southern Germany, Norway, Switzerland, the UK etc.).
Frequency	Available for 2008 only. No time series so far, which would be needed to analyse the temporal development. Since INTERREG projects usually last more than one year, indicator interval of 2 or 3 years would be sufficient.
Improvements	Indicator should be extended to the missing countries, and data gaps should be closed. Moreover, a time series should be constructed allowing to analyse changes over time.
Geographic levels	Available at NUTS-2 level
Author	Adam Ploszaj, ESPON TERCO project

Aspect	Description
Indicator name	Cooperation degree
Theme	Governance
Policy objective	Integrated polycentric territorial development. Cooperation and coordination can reinforce territorial integration.
Core indicator	Yes
Type of indicator	simple, quantitative, dynamic indicator, stock
Methodology	Indicator defined as the degree of cooperation in terms of the number of collaborating regions in INTERREG projects
Quality	Data quality is good. NUTS-2 results show interesting disparities and remarkable differences.
Availability	Data available for EU27. Data missing for Turkey and Western Balkans, but there are also gaps for some regions in EU27 (for instance in southern Germany, Norway, Switzerland, the UK etc.).
Frequency	Available for 2008 only. No time series so far, which would be needed to analyse the temporal development. Since INTERREG projects usually last more than one year, indicator interval of 2 or 3 years would be sufficient.
Improvements	Indicator should be extended to the missing countries, and data gaps should be closed. Moreover, a time series should be constructed allowing to analyse changes over time.
Geographic levels	Available at NUTS-2 level
Author	Adam Ploszaj, ESPON TERCO project

Annex 11. Acronyms

AI	Adobe Illustrator (vector graphics format)
AML	Arc Macro language (ESRI scripting language)
CC	Candidate Countries
CU	ESPON Coordination Unit
DB	Database
EC	European Commission
EEA	European Environment Agency
EFGS	European Forum for GeoStatistics
ESDP	European Spatial Development Perspectives
ESPON	European Observation Network for Territorial Development and Cohesion (formerly : European Spatial Planning Observation Network)
EU	European Union
FOD	French Overseas Departments
FUA	Functional Urban Area
GBIF	Global Biodiversity Information Facility
GERD	Gross domestic Expenditure on Research and Development
GIS	Geographical Information System
HDI	Human Development Index
ILO	International Labour Organization
INTERCO	Indicators of territorial cohesion (ESPON Project 2013/3/2)
ISDR	International Strategy for Disaster Reduction
JRC	Joint Research Centre
LAU	Local Administrative Unit
LEB	Life expectancy at birth
MC	ESPON Monitoring Committee
MDGs	Millennium Development Goals
MXD	Map file document (ESRI document for map symbology)
NUTS	Nomenclature of Territorial Units for Statistic
PCC	Potential Candidate Countries
PM	Particulate Matter
PNG	Portable Network Graphic (internet graphic standard file format)
PP	Project Partner
PPP	Purchasing Power Parity
R&D	Research and Development

SD	Sustainable Development
SILC	Statistics on Income and Living Conditions
TA	Territorial Agenda
TC	Territorial cohesion
TEC	Treaty establishing the European Community
TEU	Treaty on European Union
TEN	Trans-European Networks
TFEU	Treaty on the Functioning of the European Union
ToR	Terms of Reference
TPG	Transnational Project Group
TSP	Territorial State and Perspectives of the European Union
UNEP-WCMC	UNEP World Conservation Monitoring Centre
UTH	Urban Territorial Horizon
VBA	Visual Basic for Applications
WBT	Western Balkans and Turkey
WCSDG	World Commission on the Social Dimension of Globalisation
WHO	World Health Organization

INTERCO
Indicators of territorial cohesion

Scientific Platform and Tools Project 2013/3/2

Final Report

Annex 12
INTERCO Tools User Manual

Version 14 Sep. 2012

EUROPEAN UNION
Part-financed by the European Regional Development Fund
INVESTING IN YOUR FUTURE

This report presents the draft final results of a “Scientific Platform and Tools” Project conducted within the framework of the ESPON 2013 Programme, partly financed by the European Regional Development Fund.

The partnership behind the ESPON Programme consists of the EU Commission and the Member States of the EU27, plus Iceland, Liechtenstein, Norway and Switzerland. Each partner is represented in the ESPON Monitoring Committee.

This report does not necessarily reflect the opinion of the members of the Monitoring Committee.

Information on the ESPON Programme and projects can be found on www.espon.eu

The web site provides the possibility to download and examine the most recent documents produced by finalised and ongoing ESPON projects.

This basic report exists only in an electronic version.

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List of Abbreviations

Abbreviation	Meaning
AI	Adobe Illustrator Graphic file format
ASCII	American Standard Code for Information Interchange
DB	Database
DBF	File extension for dbase files
GDP	Gross Domestic Product
GIS	Geographical Information System
INTERCO_DB	INTERCO GIS Database
ISO	International Standardisation Organization
LYR	ArcGIS layer file
MXD	ArcGIS Map template file
NUTS	Nomenclature des unités territoriales statistiques
PGDB	Personal geodatabase (ESRI database format)
PM	Particular matter
PNG	Portable network graphic file
PPS	Purchasing Power Standards
PY	File extension for Python scripts
R&D	Research and Development
TBX	File extension for ArcGIS Toolboxes
TOC	Table of contents (in ArcMap software)
UMZ	Urban Morphological Zones

1. Introduction

The INTERCO Tools User Manual describes the developed INTERCO GIS Database and its associated files in full detail. The report structure is corresponding to the structure of the CD-ROM/DVD.

Chapter 2 describes the structure of the INTERCO CD-ROM/DVD, the installation procedure and the hardware and software requirements. The structure, contents and individual elements of the INTERCO GIS Database are explained in **Chapter 3**, following the introduction to the cartography and mapping in **Chapter 4**. **Chapter 5** briefly describes generated layer files. The developed tools to calculate and process the INTERCO indicators are presented in **Chapter 6**. The following **Chapter 7** then provides insights in the exchange files which are used to exchange indicator results (both numbers and maps) between the GIS and other software environments. **Chapter 8** deals with the overall documents, while the concluding **Chapter 9** introduces the concept for the indicator coding as applied in the ESPON INTERCO project.

The actual metadata for the selected territorial cohesion indicators are, however, not desribed in this User Manual. There is a dedicated indicator metdata annex which provides all required metadata information. Moreover, the indicator Excel files also provide the full metadata description following the metadata guidelines as developed by the ESPON M2D project.

2. INTERCO CD-ROM/DVD

2.1 Contents

The overall output of all GIS works of INTERCO is being made available on CD-ROM/DVD, which accompanies the INTERCO Final Report. The CD-ROM/DVD store the user manual, all produced maps, the indicators themselves, as well as their input data, and the tools to calculate or process them.

All this is made available on the CD-ROM/DVD in a comprehensive folder structure. The available folders are:

CARTO folder storing all generated MXD files for indicator mapping

DOC folder storing the metadata documentation and the user manual

EXCEL collection of Excel files in the ESPON format providing data on selected territorial cohesion indicators along with their metadata

LYRS collection of layers files for mapping (referenced in MXD files)

MAPS collections of all produced maps in PNG and Adobe Illustrator (AI) file formats, exported from ArcGIS

TOOLS folder storing the INTERCO toolbox and the developed scripts

The generated INTERCO GIS Database (**INTERCO_DB**) in ArcGIS Personal Geodatabase format is stored in parallel to these sub-directories.

2.2 Installation

To use this database, no specific installation routine is required. Just copy the files onto hard disc, create a new or use an already existing workspace or folder. After copying, the database, map files and tools are immediately ready to process.

2.3 Software requirements

Working with the Personal Geodatabase of INTERCO, with the map template files, and with the layer files requires ESRI´s ArcGIS software, version 10. The scripts under INTERCO Tools require ArcGIS version 10 and an Arcpy installation. The data files under the **EXCEL** directory can be opened with MS Office 2007 software. The produced maps stored in the **MAPS** folder can be opened with any drawing software, or with the Windows built-in picture viewers.

3. The INTERCO Database

3.1 General structure

The INTERCO geodatabase is implemented in ESRI´s Personal Geodatabase format (PGDB) of ArcGIS Version 10.x, and is named **INTERCO_DB**. The overall geodatabase is structured by so-called feature datasets, feature classes and tables.

A *feature dataset* is a collection of related feature classes that share a common coordinate system. Feature datasets within a geodatabase are used to spatially or thematically organize and integrate related feature classes.

Feature classes are homogeneous collections of common features, each having the same spatial representation, such as points, lines or polygons, and a common set of attribute columns (fields). The four widely used feature classes in a geodatabase are points, lines, polygons and annotations.

The third building block of a geodatabase is tables. Tables store statistical data. The tables are not permanently linked to any feature class, but if a common field exist both a table and a feature class may be joined to each other. The join may be furthermore permanently saved in a so-called *relationship class*.

The **INTERCO_DB** PGDB comprises feature datasets, feature classes and standalone tables, as shown in Figure 1:

- the feature dataset called **ADMINISTRATIVE_BOUNDARIES** stores line and polygon layers representing administrative units. Most of these layers were imported from the overall ESPON Database, however, the layers called **ZONES_INTERCO*** represents the newly created INTERCO NUTS region layers.
- the feature dataset called **LANDCOVER** provides land cover and land use layers. Currently two layers are available, which are the **LAKES** layer, i.e. a layer representing water bodies derived from the seamless ESPON NUTS5 municipality layer, and the **UMZ_PROJECT** layer, which represents settlements/urban areas, taken from the overall ESPON Database.
- the feature dataset called **OTHER_LAYERS** comprises various other layers that are needed for drawing maps or for GIS processing. All layers subsumed under this feature datasets were taken from the ESPON Database.
- Apart from these feature datasets, the **INTERCO_DB** PGDB provides a number of different standalone tables, which can be combined into three groups: First, the template tables **ZONE_TEMPLATE_TABLE_NUTS3,**

ZONE_TEMPLATE_TABLE_NUTS2, **ZONE_TEMPLATE_TABLE_NUTS1**, and **ZONE_TEMPLATE_TABLE_NUTS0** are template tables providing lists of all NUTS 3, 2, 1, and 0 regions that are used in INTERCO. These templates can be used to create new tables. Tables starting with **RD*** and followed by numeric numbers represent "raw data" tables, i.e. tables to provide raw data that are needed to calculate certain indicators but that are not indicators itself. Finally all standalone tables starting with **IC_*** store the actual indicators (indicator tables), where one table is supposed to store all indicators belonging to a particular category (**IC**) for a specific spatial level. The actual spatial level is provided as suffix to the table name **(*_NUTS0, *_NUTS1, *_NUTS2**, or ***_NUTS3**). The following eleven indicator categories were initially identified:

- Agriculture and Fisheries
- Demography
- Transport, accessibility and communication
- Energy
- Land use
- Social and cultural affairs, quality of life
- Economy, labour force
- Environment quality, natural assets, hazards
- Governance
- Territorial structure
- Non & cross-thematic data

These categories correspond to the classification scheme (thesaurus) of the overall ESPON database, which later on allows a smooth integration of the INTERCO indicators into the ESPON database. Each category is further subdivided into sub-categories, which again were derived from the ESPON database categorisation. Table 1 illustrates the categories and sub-categories of the ESPON DB which are applied to set up the INTERCO GIS Database.

Note that there will not be data tables for each spatial level for each of these categories; rather there will only be data tables as far as indicators are available (otherwise there would be a number of empty tables). After indicator identification and indicator selection, it turned out that no indicators were selected for some of the above categories (like agriculture and fisheries, or land use), consequently no data tables are included in the overall INTERCO database.

There will be one column per indicator in the **IC_*** tables. The column header corresponds to the unique INTERCO indicator code (see Chapter 9).

- The metadata describing the **INTERCO_DB** PGDB are not stored as part of the geodatabase. Instead they are accessible either from the Excel files (see

Chapter 7.2), or from Annex 10 to the Scientific Report (Indicator metadata, see Chapter 8 for more information; see also **DOC** sub-directory of the CD-ROM/DVD)). The metadata documentation complies with the general ESPON metadata guildelines as developed by the ESPON M2D project.

Cat. nr	Category name	Sub-cat. nr	Sub-category name
1	AGRICULTURE AND FISHERIES	1,01	Land Use
		1,02	Farms Structure
		1,03	Employment
		1,04	Livestock
		1,05	Production
2	DEMOGRAPHY	2,01	Population Structure
		2,02	Migration
		2,03	Total population
		2,04	Urban - rural population
3	TRANSPORT, ACCESSIBILITY, COMMUNICATION	3,01	Transport Infrastructure
		3,02	Passengers and Good Transport
		3,03	Accessibility
		3,04	Impacts of Transport Policies
		3,05	Information & Communication Technologies
4	ENERGY	4,01	Energy
5	LAND USE	5,01	Land Use
6	SOCIAL AND CULTURAL AFFAIRS, QUALITY OF LIFE	6,01	Households and dwellings
		6,02	Education
		6,03	Health
		6,04	Poverty
		6,05	Other social
		6,06	Culture
		6,07	Quality of life
7	ECONOMY, LABOUR FORCE	7,01	Labour force
		7,02	Employment, Unemployment
		7,03	Income and Consumption
		7,04	Investments, Finances, Expenditures
		7,05	Industry, Services
		7,06	Tourism
		7,07	Innovation
		7,08	Business, all sectors
8	ENVIRONMENT QUALITY, NATURAL ASSETS, HAZARDS	8,01	Environment quality
		8,02	Natural assets
		8,03	Climate change
		8,04	Risks, hazards
9	GOVERNANCE	9,01	Governance
10	TERRITORIAL STRUCTURE	10,01	Urban structure
		10,02	Regional/ Territorial structure
99	NON - CROSS-THEMATIC DATA	99,01	Integrative indices and typologies
		99,02	Geographical objects

Table 1. Categories and sub-categories of the ESPON DB.

Generally the indicator tables include data for all selected territorial cohesion indicators, except for those based upon SILC survey. Due to copyright and privacy issues, the SILC data cannot be provided as part of the INTERCO geodatabase.

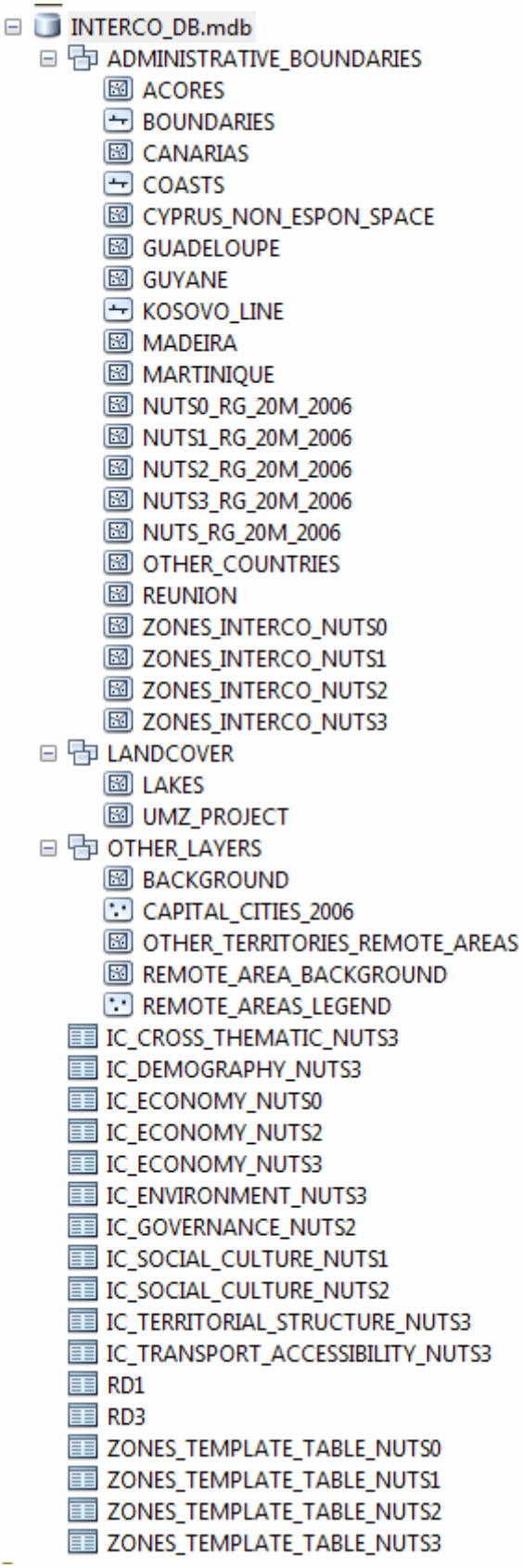

Figure 1. INTERO_DB database structure and contents.

3.2 Projection and coordinate system

The coordinate system of the **INTERCO_DB** database is as follows:

```
Projection: Lambert_Azimuthal_Equal_Area
False_Easting: 4321000,000000
False_Northing: 3210000,000000
Central_Meridian: 10,000000
Latitude_Of_Origin: 52,000000
Linear Unit: Meter (1,000000)

Geographic Coordinate System: GCS_ETRS_1989
Angular Unit: Degree (0,017453292519943299)
Prime Meridian: Greenwich (0,000000000000000000)
Datum: D_ETRS_1989
  Spheroid: GRS_1980
    Semimajor Axis: 6378137,000000000000000000
    Semiminor Axis: 6356752,314140356100000000
    Inverse Flattening: 298,257222101000020000
```

3.3 Feature datasets

Following is a description of the structure and contents of feature datasets of the **INTERCO_DB** GIS database. The description follows the order of the database.

3.3.1 Administrative boundaries

This feature dataset stores line and polygon layers representing administrative units for entire Europe. Most of these layers were imported from the overall ESPON Database, however, the layers called **ZONES_INTERCO*** represents the newly created INTERCO NUTS region layers.

Altogether, 21 feature classes are subsumed under this dataset (Figure 2).

Most of these feature classes are only used to draw up the INTERCO maps. Since they only provide basic geometries, they do not comprise any specific user-defined fields. As an exception from this, the four feature classes **ZONES_INTERCO_NUTS0 … ZONES_INTERCO_NUTS3** are furthermore used for indicator calculation and also include some specific fields.

Even though the names of the feature classes should be self-explaining, Table 2 summarizes the contents of the layers in alphabdetical order.

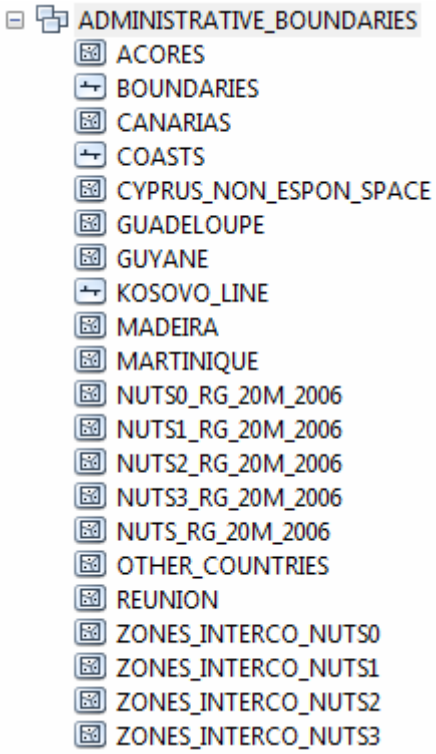

Figure 2. Feature classes available in `ADMINISTRATIVE_BOUNDARIES` feature dataset.

Name of feature class	Object type	Description
Acores	polygons	Coastlines of Acores islands
Boundaries	lines	Country boundaries in Europe
Canarias	polygons	Coastlines of Canarias islands
Coasts	lines	Coastlines of coast in Europe
Cyprus_non_ESPON_space	polygons	Boundaries of Northern Cyprus
Guadeloupe	polygons	Coastlines of Guadeloupe
Guyane	polygons	Coastline and boundaries of Guyane
Kosovo_line	lines	Boundaries of Kosovo
Madeira	polygons	Coastlines of Madeira islands
Martinique	polygons	Coastlines of Martinique
NUTS0_RG_20M_2006	polygons	Country boundaries in Europe, 2006 NUTS classification, outermost regions moved to Russia, excluding neighboring regions, Candidate countries and Western Balkans
NUTS1_RG_20M_2006	polygons	NUTS1 region boundaries in Europe, 2006 NUTS classification, outermost regions moved to Russia, excluding neighboring regions, Candidate countries and Western Balkans
NUTS2_RG_20M_2006	polygons	NUTS2 region boundaries in Europe, 2006

		NUTS classification, outermost regions moved to Russia, excluding neighboring regions, Candidate countries and Western Balkans
NUTS3_RG_20M_2006	polygons	NUTS3 region boundaries in Europe, 2006 NUTS classification, outermost regions moved to Russia, excluding neighboring regions, Candidate countries and Western Balkans
Other_countries	polygons	Country boundaries of neighboring countries, Candidate Countries and Western Balkans.
Reunion	polygons	Coastline of Reunion
ZONES_INTERCO_NUTS0	polygons	Country boundaries in Europe, 2006 NUTS classification, including Candidate countries and Western Balkans.
ZONES_INTERCO_NUTS1	polygons	NUTS1 region boundaries in Europe, 2006 NUTS classification, including Candidate countries and Western Balkans.
ZONES_INTERCO_NUTS2	polygons	NUTS2 region boundaries in Europe, 2006 NUTS classification, including Candidate countries and Western Balkans.
ZONES_INTERCO_NUTS3	polygons	NUTS3 region boundaries in Europe, 2006 NUTS classification, including Candidate countries and Western Balkans.

Table 2. Overview of feature classes under ADMINISTRATIVE_BOUNDARIES.

The four feature classes **ZONES_INTERCO_NUTS0, … ,ZONES_INTERCO_NUTS3** include the following specific attributes (fields) (note that not all fields are available in all four feature classes, as indicated by the symbols in Table 3):

NUTS1_CODE, NUTS2_CODE and **NUTS3_CODE** give the official NUTS region code as assigned by Eurostat. Regions in non-EU countries have been assigned similar codes. **ISO_COUNTR** gives the 2-digit ISO country code of the country, in which the region is located.

Since some NUTS3 region are composed of several polygons (for instance, islands or en-claves), but there is only one centroid assigned to each region, the field **CENTROIDS** distinguishes those polygons within which the centroid is located (**CENTROIDS=1**) from the other polygon(s) without centroid (**CENTROIDS=0**). **POLY_NUMB** indicates the number of polygons that belong to one NUTS3 region.

While **POLY_AREA** gives the area of each individual polygon, **N0AREA, N1AREA, N2AREA, N3AREA** gives the total area of each NUTS0, NUTS1, NUTS2 and NUTS3 regions. In cases where a NUTS3 region consists of just one polygon, **POLY_AREA =**

N3AREA; in cases where a NUTS3 region is composed of several polygons, **N3AREA** gives the sum of all polygon areas.

Field name	Type	Content	N0	N1	N2	N3
ISO_COUNTR	Text	2-letter ISO country code	✓	✓	✓	✓
NUTS1_CODE	Text	NUTS1 region code	✘	✓	✓	✓
NUTS2_CODE	Text	NUTS2 region code	✘	✘	✓	✓
NUTS3_CODE	Text	NUTS3 region code	✘	✘	✘	✓
CENTROID	Integer	Flag to indicate centroid 0 = Additional polygon 1 = Polygon where centroid is located	✘	✘	✘	✓
N3AREA	Double	Total NUTS3 region area (in m^2)	✘	✘	✘	✓
N2AREA	Double	Total NUTS2 region area (in m^2)	✘	✘	✓	✘
N1AREA	Double	Total NUTS1 region area (in m^2)	✘	✓	✘	✘
N0AREA	Double	Total NUTS0 region area (in m^2)	✓	✘	✘	✘
POLY_AREA	Double	Polygon area (in m^2)	✘	✘	✘	✓
POLY_NUMB	Integer	Number of polygons	✓	✓	✓	✓

Table 3. Available fields in the `ZONES_INTERCO_NUTS*` feature classes.

3.3.2 Landcover

This feature dataset provides land cover and land use layers. Currently two layers are available (Figure 3), which are the **LAKES** layer, i.e. a layer representing water bodies derived from the seamless ESPON NUTS5 municipality layer, and the **UMZ_PROJECT** layer, which represents settlements/urban areas, taken from the overall ESPON Database.

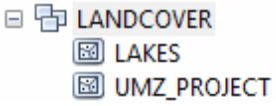

Figure 3. Feature classes available in LANDCOVER feature dataset.

These two feature classes can be used for cartographic design, but also for specific GIS-based analyses.

3.3.3 Other layers

This feature dataset comprises various other layers that are needed for drawing maps or for GIS processing. All layers subsumed under this feature datasets were taken from the ESPON Database. Table 4 lists the available layers and their contents.

Name of feature class	Object type	Description
Background	polygons	ESPON background layer
Capital_Cities_2006	Points	Location of capitals
Other_territories_remote_area	polygons	Coastlines and boundaries of other territories in remote areas
Remote_area_background	polygons	Background for remote areas
Remote_areas_legend	points	Ankor points for annotation of remote areas

Table 4. Overview of feature classes under OTHER_LAYERS.

3.4 Indicator tables

The selected territorial cohesion indicators are stored in so-called indicator tables, subdivided by category (see Chapter 9.1). Altogether, eleven indicator tables are available (Table 5), all of them prefixed with **IC_*** and suffixed by the NUTS level for which they store the indicators.

The structure of all these indicator tables is described one-by-one in the following Tables 6 to 16. Unlike the Excel files (Chapter 7.2) each indicator table usually comprise several territorial cohesion indicators. In most cases the tables provide the indicators for several years (time series). The name of the fields storing the indicators correspond to the indicator codes, as explained in Chapter 9, prefixed with "**I**" (since ArcGIS does not allow to start field names with a number). The number of fields associated with each tables depends on the number of indicators and the number of years for which each indicator is available.

Indicator table name	Level	Contents
IC_CROSS_THEMATIC_NUTS3	3	Urban topology
IC_DEMOGRAPHY_NUTS3	3	Gender imbalances Net migration rate Old age dependency ratio Ageing index
IC_ECONOMY_NUTS0	0	Labour productivity per person employed
IC_ECONOMY_NUTS2	2	Employment rate Intramural R&D expenditures Disposable household income Differences unemployment rate
IC_ECONOMY_NUTS3	3	Unemployment rate GDP per capita
IC_ENVIRONMENT_NUTS3	3	Air polluation: Ozone concentration Air pollution: PM10 Soil sealing per capita
IC_GOVERNANCE_NUTS2	2	Cooperation intensity Cooperation degree
IC_SOCIAL_CULTURE_NUTS1	1	Early school leavers
IC_SOCIAL_CULTURE_NUTS2	2	Life expectancy at birth Tertiary education
IC_TERRITORIAL_STRUCTURE_NUTS3	3	Population potential
IC_TRANSPORT_ACCESSIBILITY_NUTS3	3	Accessibility potential air Accessibility potential rail Accessibility potential road

Table 5. Available indicator tables (overview).

Field name	Type	Description
NUTS3_CODE	Text	NUTS3 region code
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	NUTS0 region code
NUTS3_AREA	Double	NUTS3 region area (in m^2)
I1002URBTOPO_2010N3ORD	Integer	Urban topology PR = Predominantly rural IN = Intermediate region PU = Predominantly urban

Table 6. Fields in indicator table `IC_CROSS_THEMATIC_NUTS3`.

Field name	Type	Description
NUTS3_CODE	Text	NUTS3 region code
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	NUTS0 region code
NUTS3_AREA	Double	NUTS3 region area (in m^2)
I0201GENDIMB_2000N3RTD	Double	Gender imbalances, 2000
I0201GENDIMB_2001N3RTD	Double	Gender imbalances, 2001
I0201GENDIMB_2002N3RTD	Double	Gender imbalances, 2002
I0201GENDIMB_2003N3RTD	Double	Gender imbalances, 2003
I0201GENDIMB_2004N3RTD	Double	Gender imbalances, 2004
I0201GENDIMB_2005N3RTD	Double	Gender imbalances, 2005
I0201GENDIMB_2006N3RTD	Double	Gender imbalances, 2006
I0201GENDIMB_2007N3RTD	Double	Gender imbalances, 2007
I0201GENDIMB_2008N3RTD	Double	Gender imbalances, 2008
I0201GENDIMB_2009N3RTD	Double	Gender imbalances, 2009
I0201OLDAGDR_2000N3RTD	Double	Old age dependecy ratio, 2000
I0201OLDAGDR_2001N3RTD	Double	Old age dependecy ratio, 2001
I0201OLDAGDR_2002N3RTD	Double	Old age dependecy ratio, 2002
I0201OLDAGDR_2003N3RTD	Double	Old age dependecy ratio, 2003
I0201OLDAGDR_2004N3RTD	Double	Old age dependecy ratio, 2004
I0201OLDAGDR_2005N3RTD	Double	Old age dependecy ratio, 2005
I0201OLDAGDR_2006N3RTD	Double	Old age dependecy ratio, 2006
I0201OLDAGDR_2007N3RTD	Double	Old age dependecy ratio, 2007
I0201OLDAGDR_2008N3RTD	Double	Old age dependecy ratio, 2008
I0201OLDAGDR_2009N3RTD	Double	Old age dependecy ratio, 2009
I0201OLDAGDR_2010N3RTD	Double	Old age dependecy ratio, 2010
I0202AGEIND_2000N3RTD	Double	Ageing index, 2000
I0202AGEIND_2001N3RTD	Double	Ageing index, 2001
I0202AGEIND_2002N3RTD	Double	Ageing index, 2002
I0202AGEIND_2003N3RTD	Double	Ageing index, 2003
I0202AGEIND_2004N3RTD	Double	Ageing index, 2004
I0202AGEIND_2005N3RTD	Double	Ageing index, 2005
I0202AGEIND_2006N3RTD	Double	Ageing index, 2006
I0202AGEIND_2007N3RTD	Double	Ageing index, 2007
I0202AGEIND_2008N3RTD	Double	Ageing index, 2008
I0202AGEIND_2009N3RTD	Double	Ageing index, 2009
I0202AGEIND_2010N3RTD	Double	Ageing index, 2010

Table 7. Fields in indicator table `IC_DEMOGRAPHY_NUTS3`.

Field name	Type	Description
ISO_COUNTR	Text	2-digits ISO country code
I0702LABPRPR_1995N0RTD	Double	Labour productivity per person employed, 1995
I0702LABPRPR_1996N0RTD	Double	Labour productivity per person employed, 1996
I0702LABPRPR_1997N0RTD	Double	Labour productivity per person employed, 1997
I0702LABPRPR_1998N0RTD	Double	Labour productivity per person employed, 1998
I0702LABPRPR_1999N0RTD	Double	Labour productivity per person employed, 1999
I0702LABPRPR_2000N0RTD	Double	Labour productivity per person employed, 2000
I0702LABPRPR_2001N0RTD	Double	Labour productivity per person employed, 2001
I0702LABPRPR_2002N0RTD	Double	Labour productivity per person employed, 2002
I0702LABPRPR_2003N0RTD	Double	Labour productivity per person employed, 2003
I0702LABPRPR_2004N0RTD	Double	Labour productivity per person employed, 2004
I0702LABPRPR_2005N0RTD	Double	Labour productivity per person employed, 2005
I0702LABPRPR_2006N0RTD	Double	Labour productivity per person employed, 2006
I0702LABPRPR_2007N0RTD	Double	Labour productivity per person employed, 2007
I0702LABPRPR_2008N0RTD	Double	Labour productivity per person employed, 2008
I0702LABPRPR_2009N0RTD	Double	Labour productivity per person employed, 2009
I0702LABPRPR_2010N0RTD	Double	Labour productivity per person employed, 2010

Table 8. Fields in indicator table `IC_ECONOMY_NUTS0`.

Field name	Type	Description
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
ISCO_COUNTR	Text	2-digits ISO country code
I0702LABPRIS_2007N2RTD	Double	Labour productivity in industry&services, 2007
I0703EMP2064_1999N2RTD	Double	Employment rate aged 20-64, 1999
I0703EMP2064_2000N2RTD	Double	Employment rate aged 20-64, 2000
I0703EMP2064_2001N2RTD	Double	Employment rate aged 20-64, 2001
I0703EMP2064_2002N2RTD	Double	Employment rate aged 20-64, 2002
I0703EMP2064_2003N2RTD	Double	Employment rate aged 20-64, 2003
I0703EMP2064_2004N2RTD	Double	Employment rate aged 20-64, 2004
I0703EMP2064_2005N2RTD	Double	Employment rate aged 20-64, 2005
I0703EMP2064_2006N2RTD	Double	Employment rate aged 20-64, 2006
I0703EMP2064_2007N2RTD	Double	Employment rate aged 20-64, 2007
I0703EMP2064_2008N2RTD	Double	Employment rate aged 20-64, 2008
I0703EMP2064_2009N2RTD	Double	Employment rate aged 20-64, 2009
I0702RDEXPIM_2007N2RTP	Double	Total intramural R&D expenditures, 2007
I0703DIHOINC_1996N2MET	Double	Disposable household income, 1996
I0703DIHOINC_1997N2MET	Double	Disposable household income, 1997
I0703DIHOINC_1998N2MET	Double	Disposable household income, 1998

I0703DIHOINC_1999N2MET	Double	Disposable household income, 1999
I0703DIHOINC_2000N2MET	Double	Disposable household income, 2000
I0703DIHOINC_2001N2MET	Double	Disposable household income, 2001
I0703DIHOINC_2002N2MET	Double	Disposable household income, 2002
I0703DIHOINC_2003N2MET	Double	Disposable household income, 2003
I0703DIHOINC_2004N2MET	Double	Disposable household income, 2004
I0703DIHOINC_2005N2MET	Double	Disposable household income, 2005
I0703DIHOINC_2006N2MET	Double	Disposable household income, 2006
I0703DIHOINC_2007N2MET	Double	Disposable household income, 2007
I0702UNEMDIFF1999N2MET	Double	Differences in female/male unemployment, 1999
I0702UNEMDIFF2000N2MET	Double	Differences in female/male unemployment, 2000
I0702UNEMDIFF20001N2MET	Double	Differences in female/male unemployment, 2001
I0702UNEMDIFF2002N2MET	Double	Differences in female/male unemployment, 2002
I0702UNEMDIFF2003N2MET	Double	Differences in female/male unemployment, 2003
I0702UNEMDIFF2004N2MET	Double	Differences in female/male unemployment, 2004
I0702UNEMDIFF2005N2MET	Double	Differences in female/male unemployment, 2005
I0702UNEMDIFF2006N2MET	Double	Differences in female/male unemployment, 2006
I0702UNEMDIFF2007N2MET	Double	Differences in female/male unemployment, 2007
I0702UNEMDIFF2008N2MET	Double	Differences in female/male unemployment, 2008
I0702UNEMDIFF2009N2MET	Double	Differences in female/male unemployment, 2009
I0702UNEMDIFF2010N2MET	Double	Differences in female/male unemployment, 2010

Table 9. Fields in indicator table `IC_ECONOMY_NUTS2`.

Field name	Type	Description
NUTS3_CODE	Text	NUTS3 region code
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	2-digits ISO country code
NUTS3_AREA	Text	NUTS3 region area (in m^2)
I0703UNEMALL_1999N3RTD	Double	Unemployment rate, 1999
I0703UNEMALL_2000N3RTD	Double	Unemployment rate, 2000
I0703UNEMALL_2001N3RTD	Double	Unemployment rate, 2001
I0703UNEMALL_2002N3RTD	Double	Unemployment rate, 2002
I0703UNEMALL_2003N3RTD	Double	Unemployment rate, 2003
I0703UNEMALL_2004N3RTD	Double	Unemployment rate, 2004
I0703UNEMALL_2005N3RTD	Double	Unemployment rate, 2005
I0703UNEMALL_2006N3RTD	Double	Unemployment rate, 2006
I0703UNEMALL_2007N3RTD	Double	Unemployment rate, 2007
I0703UNEMALL_2008N3RTD	Double	Unemployment rate, 2008
I0703UNEMALL_2009N3RTD	Double	Unemployment rate, 2009
I0708GDPPPS_1997N3RTP	Double	GDP per capita (PPS), 1997

I0708GDPPPS_1998N3RTP	Double	GDP per capita (PPS), 1998
I0708GDPPPS_1999N3RTP	Double	GDP per capita (PPS), 1999
I0708GDPPPS_2000N3RTP	Double	GDP per capita (PPS), 2000
I0708GDPPPS_2001N3RTP	Double	GDP per capita (PPS), 2001
I0708GDPPPS_2002N3RTP	Double	GDP per capita (PPS), 2002
I0708GDPPPS_2003N3RTP	Double	GDP per capita (PPS), 2003
I0708GDPPPS_2004N3RTP	Double	GDP per capita (PPS), 2004
I0708GDPPPS_2005N3RTP	Double	GDP per capita (PPS), 2005
I0708GDPPPS_2006N3RTP	Double	GDP per capita (PPS), 2006
I0708GDPPPS_2007N3RTP	Double	GDP per capita (PPS), 2007
I0708GDPPPS_2008N3RTP	Double	GDP per capita (PPS), 2008

Table 10. Fields in indicator table `IC_ECONOMY_NUTS3`.

Field name	Type	Description
NUTS3_CODE	Text	NUTS3 region code
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	2-digits ISO country code
NUTS3_AREA	Text	NUTS3 region area (in m^2)
I0801APOZONE_2008N3MET	Integer	Air pollution: Ozone concentration, 2008
I0801APPM10___2009N3MET	Integer	Air polluation: PM10, 2009
I0803SOILSEA2006N3RTD	Double	Soil sealing per capita, 2006
I0803CCH_VULN2011NEMET	Double	Potential vulnerability to climate change, 2011

Table 11. Fields in indicator table `IC_ENVIRONMENT_NUTS3`.

Field name	Type	Description
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	2-digits ISO country code
N2AREA	Text	NUTS2 region area (in m^2)
I0909COOPINT_2008N2MET	Integer	Cooperation intensity, 2008
I0909COOPDEGR2008N2MET	Integer	Cooperation density, 2008

Table 12. Fields in indicator table `IC_GOVERNANCE_NUTS2`.

Field name	Type	Description
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	2-digits ISO country code
N1AREA	Text	NUTS1 region area (in m^2)
I0602EARSLEA_2000N1RTD	Double	Proportion of early school leavers, 2000

I0602EARSLEA_2001N1RTD	Double	Proportion of early school leavers, 2001
I0602EARSLEA_2002N1RTD	Double	Proportion of early school leavers, 2002
I0602EARSLEA_2003N1RTD	Double	Proportion of early school leavers, 2003
I0602EARSLEA_2004N1RTD	Double	Proportion of early school leavers, 2004
I0602EARSLEA_2005N1RTD	Double	Proportion of early school leavers, 2005
I0602EARSLEA_2006N1RTD	Double	Proportion of early school leavers, 2006
I0602EARSLEA_2007N1RTD	Double	Proportion of early school leavers, 2007
I0602EARSLEA_2008N1RTD	Double	Proportion of early school leavers, 2008
I0602EARSLEA_2009N1RTD	Double	Proportion of early school leavers, 2009
I0602EARSLEA_2010N1RTD	Double	Proportion of early school leavers, 2010

Table 13. Fields in indicator table `IC_SOCIAL_CULTURE_NUTS1`.

Field name	Type	Description
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	2-digits ISO country code
N2AREA	Text	NUTS2 region area (in m^2)
I0603LEAB____2000N2MET	Double	Life expectancy at birth, 2000
I0603LEAB____2001N2MET	Double	Life expectancy at birth, 2001
I0603LEAB____2002N2MET	Double	Life expectancy at birth, 2002
I0603LEAB____2003N2MET	Double	Life expectancy at birth, 2003
I0603LEAB____2004N2MET	Double	Life expectancy at birth, 2004
I0603LEAB____2005N2MET	Double	Life expectancy at birth, 2005
I0603LEAB____2006N2MET	Double	Life expectancy at birth, 2006
I0603LEAB____2007N2MET	Double	Life expectancy at birth, 2007
I0603LEAB____2008N2MET	Double	Life expectancy at birth, 2008
I0603TEREDU_2008N2RTD	Double	Proportion of tertiary educated people, 2008
I0603TEREDU_2009N2RTD	Double	Proportion of tertiary educated people, 2009
I0603TEREDU_2010N2RTD	Double	Proportion of tertiary educated people, 2010

Table 14. Fields in indicator table `IC_SOCIAL_CULTURE_NUTS2`.

Field name	Type	Description
NUTS3_CODE	Text	NUTS3 region code
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	2-digits ISO country code
NUTS3_AREA	Text	NUTS3 region area (in m^2)
I1002POPPOT_2008N3MET	Double	Population potential within 50 km, 2008

Table 15. Fields in indicator table `IC_TERRITORIAL_STRUCTURE_NUTS3`.

Field name	Type	Description
NUTS3_CODE	Text	NUTS3 region code
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	2-digits ISO country code
NUTS3_AREA	Text	NUTS3 region area (in m^2)
I0303ACCPOTAI2001N3RTP	Double	Accessibility potential air, 2001
I0303ACCPOTAI2006N3RTP	Double	Accessibility potential air, 2006
I0303ACCPOTRA2001N3RTP	Double	Accessibility potential rail, 2001
I0303ACCPOTRA2006N3RTP	Double	Accessibility potential rail, 2006
I0303ACCPOTRO2001N3RTP	Double	Accessibility potential road, 2001
I0303ACCPOTRO2006N3RTP	Double	Accessibility potential road, 2006

Table 16. Fields in indicator table IC_TRANSPORT_ACCESSIBILITY_NUTS3.

3.5 Supporting tables

The **INTERCPO_DB** database furthermore contains a number of supporting tables that help the user to work with the database. The following six support tables are available in the database (Table 17):

Name of support table	Description
ZONES_TEMPLATE_TABLE_NUTS0	Template list of NUTS0 regions
ZONES_TEMPLATE_TABLE_NUTS1	Template list of NUTS1 regions
ZONES_TEMPLATE_TABLE_NUTS2	Template list of NUTS2 regions
ZONES_TEMPLATE_TABLE_NUTS3	Template list of NUTS3 regions
RD1	Raw / input data table
RD3	Raw / input data table

Table 17. Available supporting tables.

The first four tables provides template lists of NUTS regions that help to establish new tables. The template lists include region codes and region areas. By copying and renaming these tables the user can quickly establish new (empty) data tables including all ESPON regions of the particular NUTS level.

The other two tables provide input data (raw data) that are required to calculate certain selected territorial cohesion indicators. **RD1** provides input data at NUTS3 level for demographic indicators like age index and old age dependency ratio, while **RD3** provides input data at NUTS2 level on female and male unemployment rates used to caluclate the indicator on difference in unemployment rate. Tables 18 and 19 list the available fields in **RD1** and **RD3**, respectively.

Field name	Type	Description
NUTS3_CODE	Text	NUTS3 region code
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	NUTS0 region code
NUTS3_AREA	Double	NUTS3 region area (in m^2)
MALEPOP2000	Integer	Male population (in 1,000), 2000
MALEPOP2001	Integer	Male population (in 1,000), 2001
MALEPOP2002	Integer	Male population (in 1,000), 2002
MALEPOP2003	Integer	Male population (in 1,000), 2003
MALEPOP2004	Integer	Male population (in 1,000), 2004
MALEPOP2005	Integer	Male population (in 1,000), 2005
MALEPOP2006	Integer	Male population (in 1,000), 2006
MALEPOP2007	Integer	Male population (in 1,000), 2007
MALEPOP2008	Integer	Male population (in 1,000), 2008
MALEPOP2009	Integer	Male population (in 1,000), 2009
FEMALEPOP2000	Integer	Female population (in 1,000), 2000
FEMALEPOP2001	Integer	Female population (in 1,000), 2001
FEMALEPOP2002	Integer	Female population (in 1,000), 2002
FEMALEPOP2003	Integer	Female population (in 1,000), 2003
FEMALEPOP2004	Integer	Female population (in 1,000), 2004
FEMALEPOP2005	Integer	Female population (in 1,000), 2005
FEMALEPOP2006	Integer	Female population (in 1,000), 2006
FEMALEPOP2007	Integer	Female population (in 1,000), 2007
FEMALEPOP2008	Integer	Female population (in 1,000), 2008
FEMALEPOP2009	Integer	Female population (in 1,000), 2009
POPLESS15_2000	Integer	Population < 15 years, 2000
POPLESS15_2001	Integer	Population < 15 years, 2001
POPLESS15_2002	Integer	Population < 15 years, 2002
POPLESS15_2003	Integer	Population < 15 years, 2003
POPLESS15_2004	Integer	Population < 15 years, 2004
POPLESS15_2005	Integer	Population < 15 years, 2005
POPLESS15_2006	Integer	Population < 15 years, 2006
POPLESS15_2007	Integer	Population < 15 years, 2007
POPLESS15_2008	Integer	Population < 15 years, 2008
POPLESS15_2009	Integer	Population < 15 years, 2009
POPOVER64_2000	Integer	Population > 64 years, 2000
POPOVER64_2001	Integer	Population > 64 years, 2001
POPOVER64_2002	Integer	Population > 64 years, 2002
POPOVER64_2003	Integer	Population > 64 years, 2003
POPOVER64_2004	Integer	Population > 64 years, 2004
POPOVER64_2005	Integer	Population > 64 years, 2005

POPOVER64_2006	Integer	Population > 64 years, 2006
POPOVER64_2007	Integer	Population > 64 years, 2007
POPOVER64_2008	Integer	Population > 64 years, 2008
POPOVER64_2009	Integer	Population > 64 years, 2009
TOTALPOP2008	Integer	Total population (in 1,000), 2008

Table 18. Available fields in table RD1.

Field name	Type	Description
NUTS2_CODE	Text	NUTS2 region code
NUTS1_CODE	Text	NUTS1 region code
NUTS0_CODE	Text	NUTS0 region code
NUTS2_AREA	Double	NUTS2 region area (in m^2)
I0702UNEMFEM_1999N2RTD	Double	Female unemployment rate, 1999
I0702UNEMFEM_2000N2RTD	Double	Female unemployment rate, 2000
I0702UNEMFEM_2001N2RTD	Double	Female unemployment rate, 2001
I0702UNEMFEM_2002N2RTD	Double	Female unemployment rate, 2002
I0702UNEMFEM_2003N2RTD	Double	Female unemployment rate, 2003
I0702UNEMFEM_2004N2RTD	Double	Female unemployment rate, 2004
I0702UNEMFEM_2005N2RTD	Double	Female unemployment rate, 2005
I0702UNEMFEM_2006N2RTD	Double	Female unemployment rate, 2006
I0702UNEMFEM_2007N2RTD	Double	Female unemployment rate, 2007
I0702UNEMFEM_2008N2RTD	Double	Female unemployment rate, 2008
I0702UNEMFEM_2009N2RTD	Double	Female unemployment rate, 2009
I0702UNEMFEM_2010N2RTD	Double	Female unemployment rate, 2010
I0702UNEMMAL_1999N2RTD	Double	Male unemployment rate, 1999
I0702UNEMMAL_2000N2RTD	Double	Male unemployment rate, 2000
I0702UNEMMAL_2001N2RTD	Double	Male unemployment rate, 2001
I0702UNEMMAL_2002N2RTD	Double	Male unemployment rate, 2002
I0702UNEMMAL_2003N2RTD	Double	Male unemployment rate, 2003
I0702UNEMMAL_2004N2RTD	Double	Male unemployment rate, 2004
I0702UNEMMAL_2005N2RTD	Double	Male unemployment rate, 2005
I0702UNEMMAL_2006N2RTD	Double	Male unemployment rate, 2006
I0702UNEMMAL_2007N2RTD	Double	Male unemployment rate, 2007
I0702UNEMMAL_2008N2RTD	Double	Male unemployment rate, 2008
I0702UNEMMAL_2009N2RTD	Double	Male unemployment rate, 2009
I0702UNEMMAL_2010N2RTD	Double	Male unemployment rate, 2010
I0909COOPINT_2008N2RTD	Double	Cooperation intensity, projects per capita, 2008
TOTALPOP_2008	Integer	Total population, 2008

Table 19. Available fields in table RD3.

3.6 Linking indicator tables to feature classes

In the database the feature classes and the indicator tables are stored and maintained as separate datasets, which are per se not linked to each other.

ArcGIS; however, provides functionalities to (temporally) join different datasets with each other, privded that they have a common field. The common field may be numeric or text, and the field names may also differ, however, the numbers, codes or text used in both fields need to be identical. In the case of the INTERCO database the NUTS region codes can be used to join the indicator tables to the polygon feature classes with the polygon boundaries. Subject to the individual indicator in question, **`NUTS3_CODE`**, **`NUTS2_CODE`**, **`NUTS1_CODE`** or **`ISO_COUNTR`** fields can be used to establish the relationship.

Once the desired feature class and the indicator table are loaded into ArcMap, the relationship can be established by using the following procedure (Figure 4). In the **`TOC`** right-click the region feature class, select the **`Join&Relates`** tab, and click "**`Add join`**". Next select the indicator table from the dropdown list, and chose the attribute field that is common to both datasets. Finally click ok to finish this procedure and save the **`MXD`** document. Now the indicator table is joined to the feature class. Now the user can access all fields available in the indicator tables.

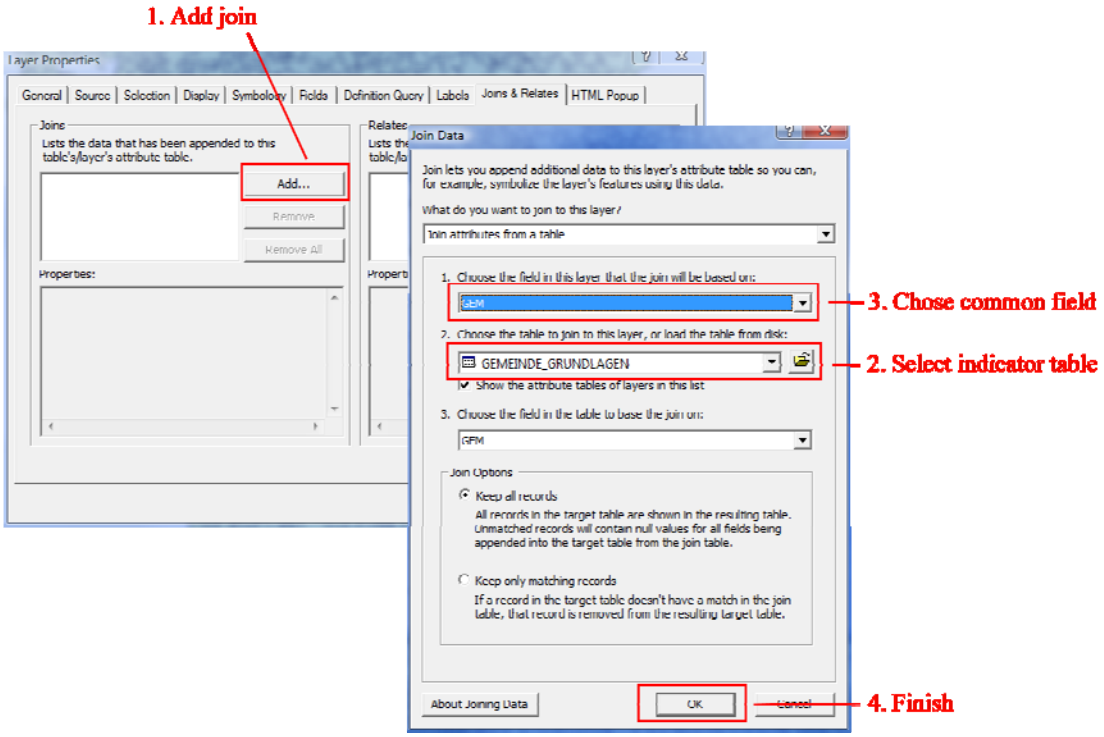

Figure 4. Establishing a join between indicator tables and feature classes in ArcMap.

4. Cartography and map files

4.1. Map layout and map templates

The mapping of the indicators and the cartographic layout is based upon the mapkits developed by the ESPON 2013 Database project. Among the four available mapkits, the ESPON Space mapkit was selected as the most suitable one for INTERCO. Even though, unlike the ESPON Space and Candidate Countries mapkit, the territory of Turkey is not fully covered by this mapkit it was selected since it provides the most detailed insight (=highest resolution) for Europe as a whole which is important to analyse spatial disparities.

All European-wide maps were produced by using this template. The template is stored as template file for ArcGIS version 10 (i.e. **MXT** and **MXD** files) in the **CARTO** directory. The map template file for INTERCO is then called **Mapkit_INTERCO.mxd** (ArcGIS Version 10.0).

The original map template **MXD** file provided by the ESPON 2013 Database project had to be amended in various directions in order to meet the INTERCO requirements (Figure 5), as follows:

(i) *Additional metadata*: above and below the map field, metadata information for the indicator in question was added, providing the reader with all necessary metadata information. The added metadata information refer to the indicator code (see Chapter 9), territorial objectives, desired direction of change (change direction), data gaps, and general years available (information above main map), as well as detailed indicator definition (added below the main map).

(ii) *Diagram*: while the main map area is used to show the territorial disparities at a given time, a diagram field was added below the map showing the sigma convergence or beta convergence graphs which analyse the spatio-temporal development of the indicator. By this, the map template shows both the territorial and temporal dimensions within one page.

(iii) *MXD file version*: all **MXD** files were created with ArcGIS Version 10.

The enhanced map template ensures that all necessary information is provided to the reader on one page; in particular both dimensions of territorial cohesion, i.e. the territorial disparities and the evolution over time, are presented at a glance.

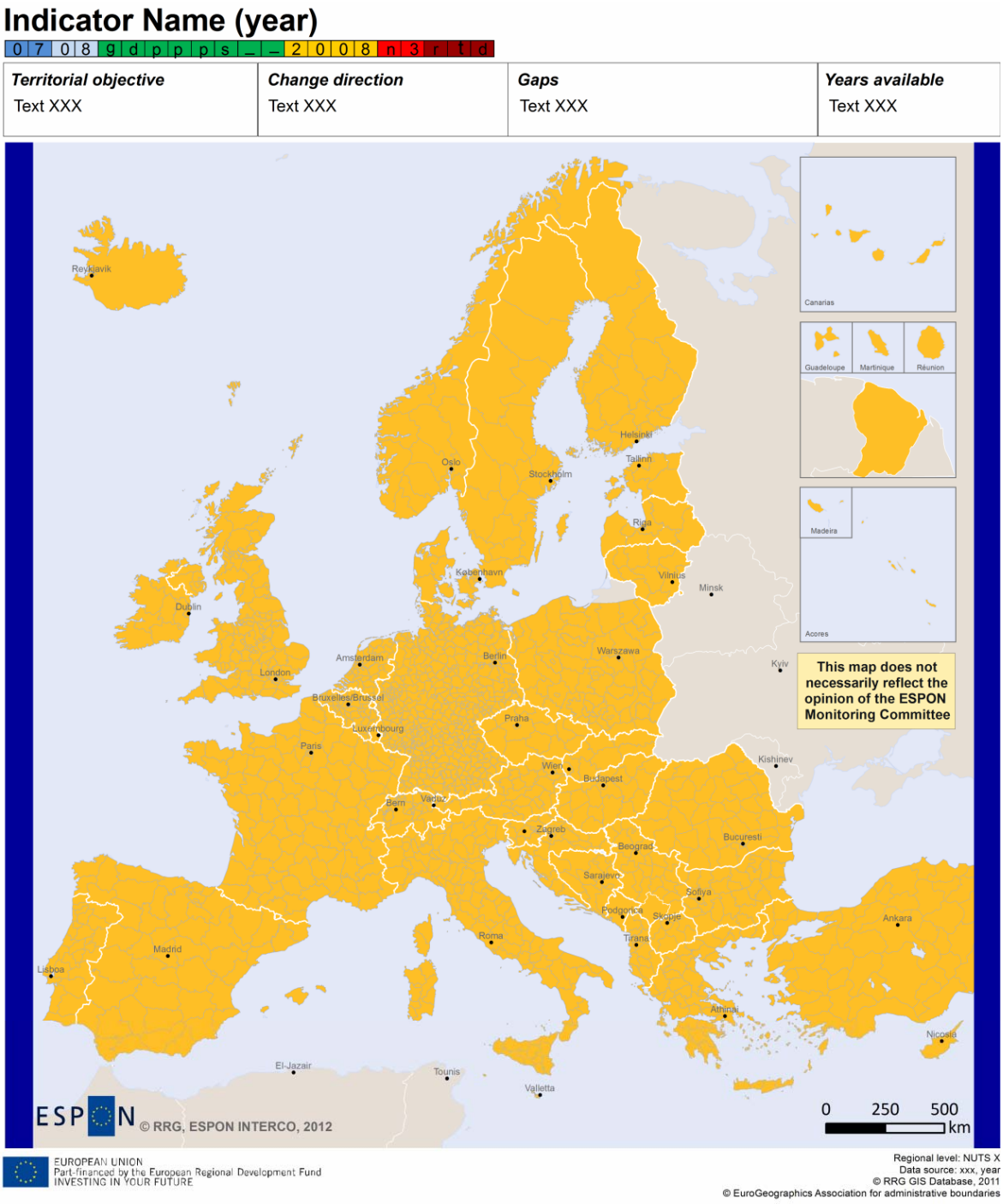

Figure 5. Enhanced INTERCO map template.

4.2. MXD file formats

All ArcGIS map template files are produced for ArcGIS version 10.

When any **MXD** file is opened from his storage directory, the indicator map should open in ArcGIS without problems. All paths to the feature classes are saved in the **MXD** documents as relative paths, i.e. the storage directory of the **MXD** file relativ to the **INTERCO_DB** database need to be maintained; if this is not the case the **MXD** file will not open properly, i.e. the feature classes will not open in ArcMAP. Therefore it is recommended always to keep the **CARTO** directory, including all its subdirectories, relative to the **INTERCO_DB** file.

If the relative paths are broken, an exclamation mark appears next to the feature class name in the table of contents (**TOC**) of ArcMap. If the paths are maintained properly the user does not have to take care about where the feature classes and tables are stored.

4.3. Available MXD files

All generated **MXD** files are stored under the **CARTO** directory in different subdirectories, where each subdirectory corresponds to the territorial objective. There are six subdirectories called

- Access_to_Services
- High_Ecological_Values
- Innovative_Territories
- Local_Economies
- Polycentric_Development
- Quality_of_life

The name of the ArcGIS **MXD** files include the full indicator code (see Chapter 9), plus the indicator name.

The **MXD** files for the maps of the INTERCO local case studies are not included in the **CARTO d**irectory since the local case studies use different input feature classes which are not part of this database. Therefore, including the **MXD** files would not be useful without the geometries.

Table 20 summarizes the available map template files.

Subdirectory	MXD file name
Access_to_Services	0303accpotai2006n3rtd_accessibility_potential_air 0303accpotai2006n3rtd_accessibility_potential_rail 0303accpotai2006n3rtd_accessibility_potential_road
High_ecological_values	0801apozone_2008n3met_air_pollution_ozone 0801appm10_2009n3met_air_polluation_pm10 0803cch_vuln2011n3met_vulnerability_climate_change 0803soilseal2006n3met_soil_sealing_per_capita
Innovative_territories	0602teredu_2010n2rtd_tertiary_education 0702rdexpim_2007n2rtp_intramural_expenditures_rd 0703emp2064_2009n2rtd_employment_rate
Local_economies	0201oldagdr_2009n3rtd_old_age_dependency_ratio 0702labpris_2007n2rtp_labour_productivity_industry_services 0702labprpe_2010n0rtp_labour_productivity_person_employed 0702unemall_2009n3rtd_unemployment_rate 0708gdppps_2008n3rtd_gdp_per_capita
Polycentric_development	0202netmigr_2007n3met_net_migration_rate 0909coopdegr2008n2met_cooperation_degree 0909coopint_2008n2met_cooperation_intensity 1002poppot_2008n3met_population_potential_50km
Quality_of_life	0201gendimb_2008n3rtd_gender_imbalances 0202ageind_2009n3rtd_ageing_index 0602earslea_2010n1etd_early_school_leavers 0603leab____2008n2met_life_expectancy 0702unemdiff_2010n2met_diff_female_male_unemp_rate 0703dihoinc_2007n2met_disposable_household_income

Table 20. Available ArcGIS MXD files in their subdirectories.

5. Layer files

5.1. What are lyr files?

A layer is a set of rules for displaying and working with datasets in ArcGIS (both ArcMap and ArcGlobe). Layer definitions include symbol assignments, classifications, labeling rules, and other map use properties. Each time a new feature class is added to ArcMap, the user has to specify these layer definitions. In order to avoid double work, the layer definitions applied to a specific feature class can be saved permanently into so called **`.lyr`** files for later usage. At later stages, the **`.lyr`** files can just be loaded into new map layouts into ArcMap, so that the user does not re-establish the overall symbology again.

Layer files do not store the geometries or attribute data of the feature classes, but only the symbologies. Therefore, when adding a layer file to a new map layout, the user must ensure that the path (i.e. the reference) to the original feature class or shapefile is still available.

In ArcGIS, a thumbnail view or preview of the layer files can be accessed via ArcCatalog. As any other feature class, **`.lyr`** files can be added to any map layout in ArcMap just by clicking the '**+**' button or by using drag&drop from ArcCatalog.

5.2. INTERCO lyr files

The layer definitions of all important feature classes used to draw up the INTERCO indicator maps are also provided as **`.lyr`** files. Figure 6 illustrates the **`.lyr`** files that constitute the basic map layout (as shown in Figure 5), which are stored in the **`LYRS`** directory. Similar layer files for the indicators were generated as well.

Figure 6. LYR files constituting the base map in thumbnail view (sample of all available layer files).

5.3. Storage of indicator lyr files

For each INTERCO indicator at least one **.lyr** file was generated, in some cases even two files. The indicator-related **.lyr** files are stored in subdirectories of the **LYRS** directory. The subdirectories are named after the territorial objectives, i.e. there are the following six subdirectorries (in alphabetical order):

- Access_to_Services
- High_Ecological_Values
- Innovative_Territories
- Local_Economies
- Polycentric_Development
- Quality_of_life

The name of the indicator layer files is constituted by three parts. The first part corresponds to the indicator name, the second part indicates the spatial NUTS level and the third part indicates the year for which the indicator is drawn. Table 21 lists the available indicator layer files along with their file path.

Subdirectory	Layer file name
Access_to_Services	Accessibility_potential_by_air_nuts3_2006 Accessibility_potential_by_rail_nuts3_2006 Accessibility_potential_by_road_nuts3_2006
High_ecological_values	Air_pollution_ozone_concentration_nuts3_2008 Air_pollution_pm10_nuts3_2009 Soil_sealing_per_capita_nuts3_2006 Vulnerability_climate_change_nuts3_2011
Innovative_territories	Employment_rate_nuts2_2009 Population_25to64_tertiary_education_nuts2_2010 Total_intramural_r&d_expenditures_nuts2_2007
Local_economies	Gdp_per_capita_pps_nuts3_2008_excl_norway Gdp_per_capita_pps_nuts3_2008_norway Labour_productivity_industry&services_nuts2_2007 Labour_productivity_nuts0_2010 Old_age_dependency_ratio_nuts3_2009 Unemployment_rate_nuts3_2009
Polycentric_development	Cooperation_degree_nuts2_2008 Cooperation_intensity_number_projects_nuts2_2008 Cooperation_intensity_projects_per_capita_nuts2_2008 Net_migration_rate_nuts3_2007 Population_potential_within50km_nuts3_2008
Quality_of_life	Ageing_index_nuts3_2009 Difference_female_male_unemployment_nuts2_2010 Disposable_household_income_norway_nuts2_2004 Disposable_household_income_nuts2_2007 Gender_imbalances_nuts3_2008 Life_expectancy_at_birth_nuts2_2008 Proportion_of_early_school_leavers_nuts1_2010

Table 21. Available layer files and storage path.

6. Scripts and Tools

6.1. Overview

In order to simplify working with the **INTERCO_DB** database, several scripts and tools have been developed. Tools comprise analysis tools, general database tools, export tools and indicator tools, all of them subsumed in a new INTERCO toolbox for ArcGIS, called **INTERCO Tools**.

Analysis tools enable simply statistical operations to quickly calculate summary statistics (minimum, mean, maximum, standard deviation, range, count) for selected indicators and years. *Database tools* allow to easily add new indicator tables based upon template lists, and to clean the database after major user operations. *Export tools* allow to quickly retrieve and export individual indicators or complete category tables from the PGDB to dbase or ASCII file formats. Finally a collection of *indicator tools* allow to update selected indicators in an easy manner.

The underlying development philosophy of these tools was to look at them from the user´s point of view, i.e. all tools are indicator-driver rathern than database driven. This means, when launching any of these tools the user needs to specify the name of the territorial cohesion indicator or the name of the territorial objective, rather than to specify the storage location or table or field name. By that the user works with the tools problem oriented rather than data oriented. The **INTERCO Tools** then take care internally at which location and in which table the selected indicators are stored.

The **INTERCO Tools** toolbox is subdivided by the four toolsets **Analysis**, **Database**, **Export** and **Indicators**, as mentioned above (Figure 7). Like any other tools under ArcGIS, they can easily be launched just by clicking the tool name. After launching any tool, the user has to enter some input before the script processes.

All tools are written in Python. They require ArcGIS Version 10 including the Arcpy installation.

Altogether eleven tools were developed, of which six are dedicated to update and re-calculate cohesion indicators. These six indicators stored in the **Indicators** toolset (ageing index, cooperation intensity per capita, difference in female-male unemployment rate, gender I mbalances, old-age dependency ratio, total population) are with the given definition not available in open statistics just as Eurostat, but need to be calculated based on raw input data such as population by sex or population by

age groups or female and male unemployment rates. The six scripts then will perform these calculations based on the raw data. The other selected INTERCO indicators, however, are either directly taken 'as is' from data providers such as Eurostat, or have been modelled by other ESPON projects (like the accessibility indicators); in both cases there is no need to provide tools for re-calculation or update of these indicators.

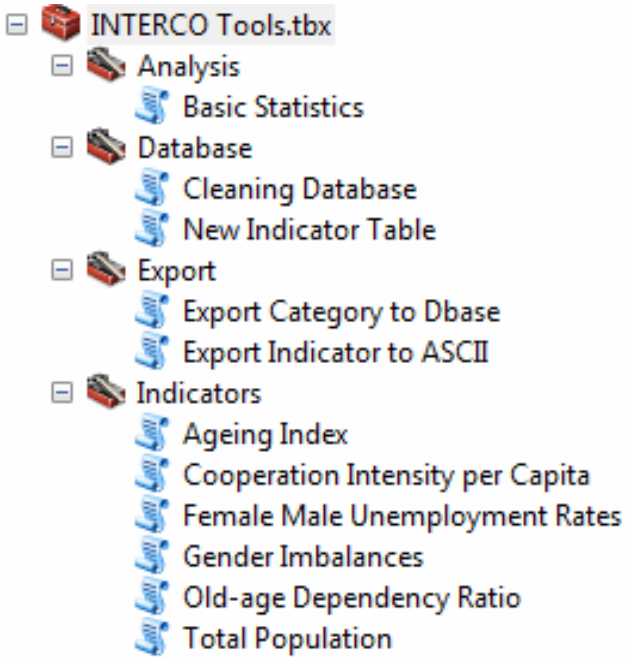

Figure 7. INTERCO Tools in ArcGIS Toolbox

While the tools (user interface) itself can be accessed through ArcCatalog from the **TOOLS** directory, the actual underlying Python scripts are stored as separate text files in the same directory. The file suffix of the Python scripts is ***.py**. There is one file per INTERCO tool. Even though these scripting files can be opened with any text editor, it is recommended not to edit them to avoid affecting their functionalities. In order to ensure a proper functioning of the tools, one should neither delete the Python scripts nor move them to another location nor delete the **INTERCO Tools** toolbox (file extension ***.tbx**). Furthermore, the entire **TOOLS** directory may not be moved in relation to the location of the **INTERCO_DB** database.

Following is a one-by-one description of each script in a standardized manner by screenshot, functionalities and user input.

6.2. Analysis toolset

There is one tool developed under this toolset called **Basic Statistics**.

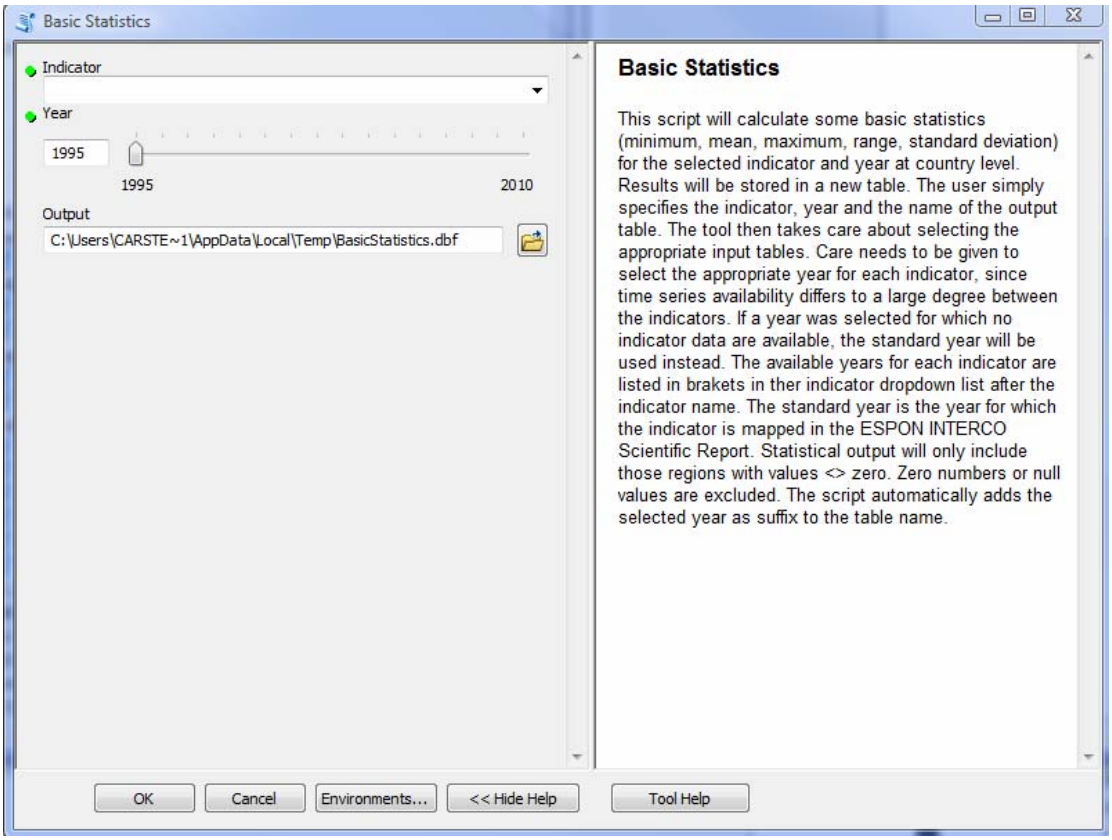

Figure 8. Tool – Basic Statistics.

Functionality

This script will calculate some basic statistics (minimum, mean, maximum, range, standard deviation) for the selected indicator and year at country level. Results will be stored in a new table. The user simply specifies the indicator, year and the name of the output table. The tool then takes care about selecting the appropriate input table. Care needs to be given to select the appropriate year for each indicator, since time series availability differs to a large degree between the indicators. The tool calculates summary statistics only for one selected year at a time. If a year was selected for which no indicator data are available, the standard year will be used instead. The available years for each indicator are listed in brakets in ther indicator dropdown list after the indicator name. The standard year is the year for which the indicator is mapped in the ESPON INTERCO Scientific Report. Statistical output will only include those regions with values different from zero. Zero numbers or null values are excluded. The script automatically adds the selected year as suffix to the table name.

Required user inputs

The user needs to select the required territorial cohesion indicator from the dropdown list. Moreover, he needs to specify the year he is interested in. Either he types in the

required year directly in the text box, or he may move the slider bar to the left or to the right. Finally he needs to indicate the name of the output table. The output table must always be a table in the **INTERCO_DB** database.

Output

A new table in the **INTERCO_DB** geodatabase with the specified table name storing the summary statistics at national level.

6.3. Database toolset

Two tools have been developed under this toolset. First, a tool called **Cleaning Database** to clean the **INTERCO_DB** database after major user input has been made to the database. This tool will restore the original default database structure again by removing all newly created tables, feature classes and feature datasets.

Second, another tool called **New Indicator Table** is available from this toolset which simplifies to add new indicator tables for a given spatial level.

6.3.1 Cleaning database

This tool is required to restore the original (default) database structure of the INTERCO GIS database (Figure 9).

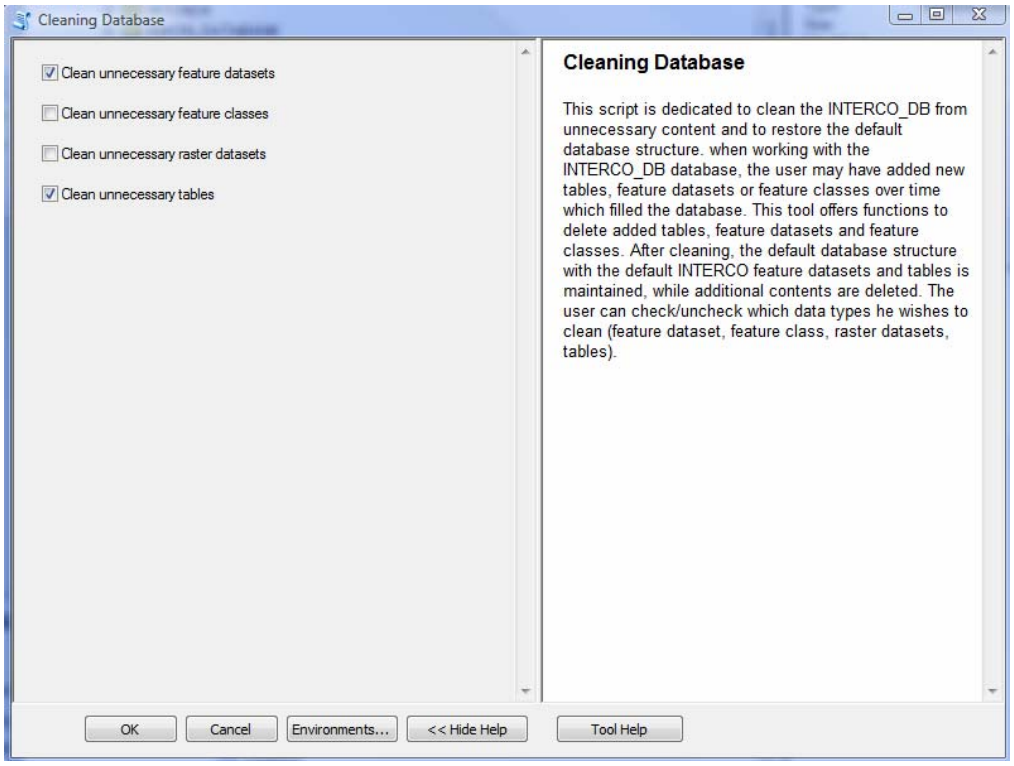

Figure 9. Tool – Cleaning Database.

Functionality

This script is dedicated to clean the **INTERCO_DB** from unnecessary content and to restore the default database structure. when working with the **INTERCO_DB** database, the user may have added new tables, feature datasets or feature classes over time which filled the database. This tool offers functions to delete added tables, feature datasets and feature classes. After cleaning, the default database structure with the default INTERCO feature datasets and tables is restored, while additional contents are deleted. The user can check/uncheck which data types he wishes to clean (feature dataset, feature class, raster datasets, tables). By default, the tool cleans unnecessary feature datasets and tables, but optionally also feature classes and raster datasets can be cleaned. Note that all tables created with the **Basic Statistics** tool, with the **New Indicator Table** tool or with all scripts from the **Indicators** toolset will be deleted by the **Cleaning Database** tool.

Required user inputs

The user is asked to select / unselect the required data types he wishes to clean. He may check/uncheck option boxes for feature datasets (default), feature classes, raster datasets and tables (default).

Output

This tool does not generate any new output, but does restore the default (original) database structure of the **INTERCO_DB** database. Only those feature datasets and tables that are part of the original database are maintained; all other data will be deleted without any warning.

6.3.2 New indicator table

This tool assists the user in generating new indicator tables in an easy manner (Figure 10).

Functionalities

This tool generates a new indicator table in **INTERCO_DB** database for the selected NUTS level and optionally adds new fields to it. The new table must not exist. The new tables are based upon the template region lists which are already part of the INTERCO GIS database. All fields added optionally to a table is of double type. The new fields will be empty by default.

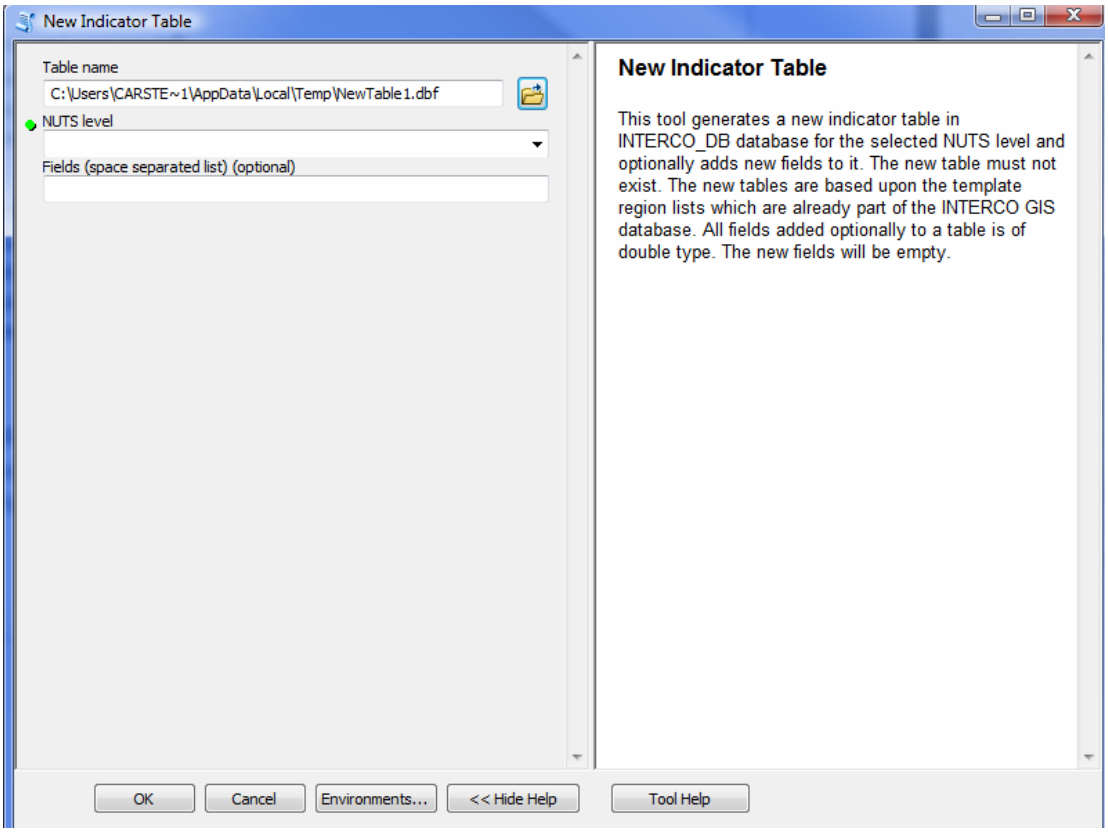

Figure 10. Tool – New Indicator Table.

Required user inputs

The user needs to specify the name of the new table. The table will be stored as a new table in the **INTERCO_DB** database. Further, the user needs to select the spatial level from the dropdown list. He can select between country level, NUTS1, NUTS2 or NUTS3 levels. Optionally he can also specify the names of new fields to add. He can add as many fields as he likes. Field names will be separated by blank in the input text box. All fields will be of **DOUBLE** field type. By default the fields will be created but will be empty.

Output

The tool generates a new table with the specified table name and optionally adds the indicated fields to it. The table will already be populated with the list of regions, including region codes. This list is subject to the selected spatial level.

6.4. Export toolset

This toolset comprise two tools: one tool named **Export Category to Dbase** exports an entire category table to a dbase table. Another tool named **Export Indicator to ASCII** exports the selected indicator to ASCII file format for all available years.

6.4.1 Export Category to Dbase

This tool can be used to expored an entire category table to dbase format (Figure 11). Entire category table, for instance, corresponds to an indicator table from the **INTERCO_DB** database like **IC_DEMOGRAPHY_NUTS3**. The tool exports the entire table 'as is'; if the table comprise several indicators for several years, the tool exports all the indicators for all the available years.

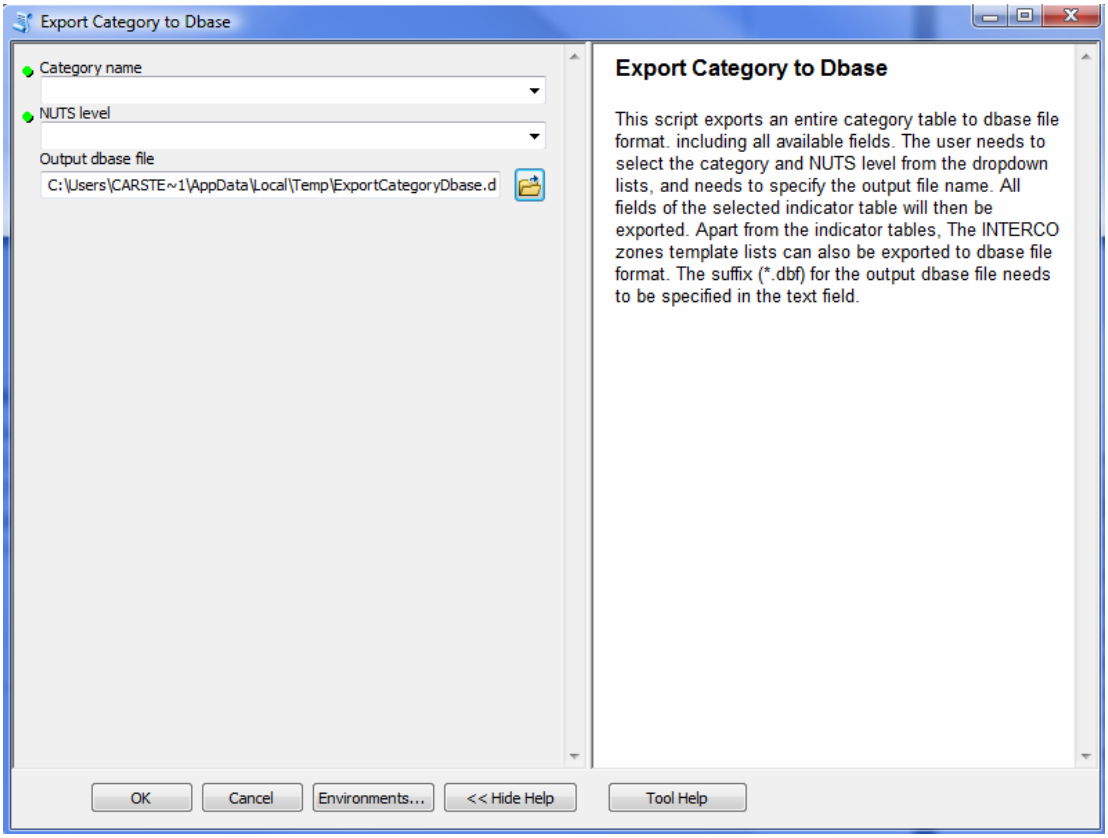

Figure 11. Tool – Export Category to Dbase.

Functionalities

This script exports an entire category table to dbase file format, including all available fields. The user needs to select the category and NUTS level from the dropdown lists, and needs to specify the output file name. All fields of the selected indicator table will then be exported. Apart from the indicator tables, The INTERCO zones template lists can also be exported to dbase file format. The suffix **(*.dbf**) for the output dbase file needs to be specified in the text field. The tool takes care to export the appropriate table from the database, subject to the selcted category and NUTS level (the user does not need to know the table name from the database). If an indicator table is not available for the selected category-NUTS level combination, no export will be triggered.

Required user inputs

From the first dropdown list, the user needs to select the category he is interested in. Available categories comprise demography, economy, environment, governance, social and cultural affairs, territorial structure, transport and accessibility, cross thematic issues as well as the zonal template list. From the second dropdown list he needs to pick up the NUTS level. Choices here are country level, NUTS1, NUTS2 or NUTS3 level.

Output

The tool generates a new dbase table at the given location which includes all fields from the selected category table. Field names may be truncated.

6.4.2 Export Indicator to ASCII

This tool exports the selected indicator to ASCII file format for further processing (Figure 12). Unlike the previous tool, this tool does not export entire category tables including several indicators, but it only exports the selected indicator. If data are available for this indicator for several years, all years will be exported.

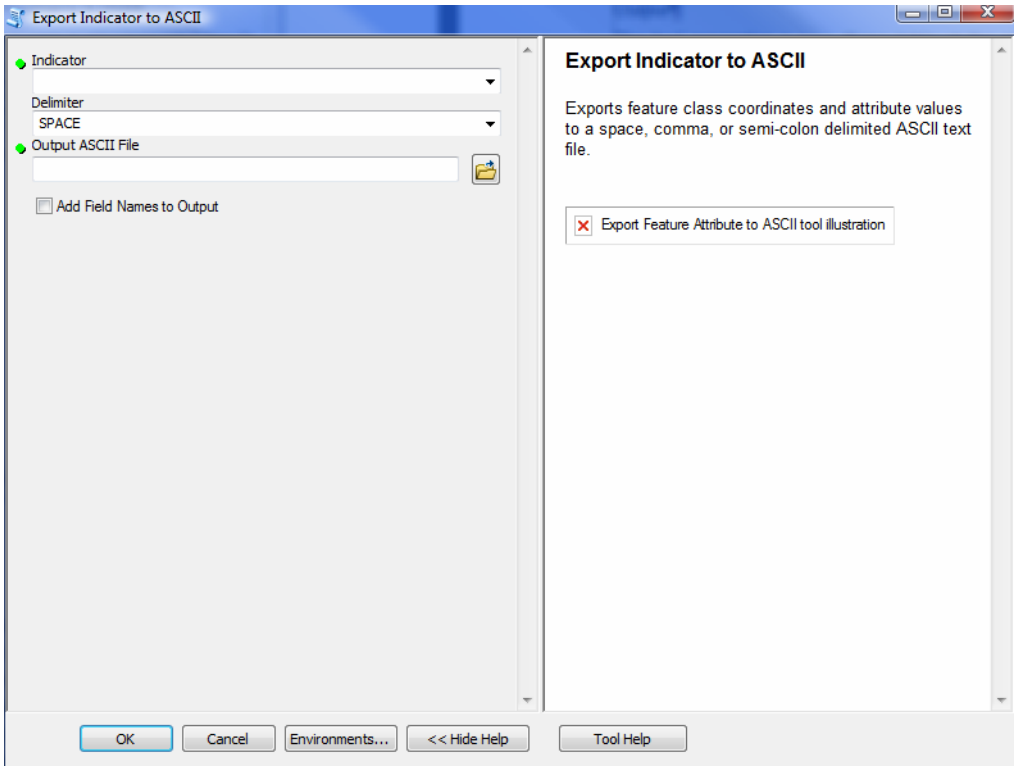

Figure 12. Tool – Export Indicator to ASCII.

Exporting indicar values to ASCII files is useful for further data processing outside a GIS.

Functionalities

This script will create a space, comma, or semi-colon delimited ascii text file of the indicator selected for export. The user just selects the indicator he is interested in, while the tool automatically takes care about the appropriate indicator tables and the available years.

Required user input

The user needs to select the indicator from the dropdown list. Further he needs to specify the delimiter (space, comma or semi-colon), depending on his further processing needs. He also needs to specify the output ASCII file name, and may also check whether or not the field names should also be exported to the file.

Output

A new ASCII file at the specified location. The ASCII file will include data for the selected indicator, for all available years. Each column will represent one year. Subject to the selected indicator, the output file will provide data at country level, NUTS1, NUTS2 or NUTS3 level. Each file comprise data for one spatial level only.

6.5. Indicators toolset

This toolset comprise six tools dedicated to update or recalculate the following territorial cohesion indicators:

- Ageing index
- Cooperation intensity per inhabitant
- Difference in female-male unemployment rates
- Gender imbalances
- Old-age dependency ratio
- Total population

Unlike the remaining selected indicators of territorial cohesion, these ones cannot be obtained from standard statistics given their actual definition. Instead, the indicators are calculated based upon input data provided through the raw data tables (see Chapter 3.5).

A common feature of all these tools is that they will not overwrite existing indicator tables or existing fields in any indicator table, but that new tables will be generated in the **INTERCO_DB** database. The generated tables will include the raw ('input') data as well as the calculated indicators as such.

6.5.1 Ageing index

This tool re-calculates the indicator ageing index (Figure 13).

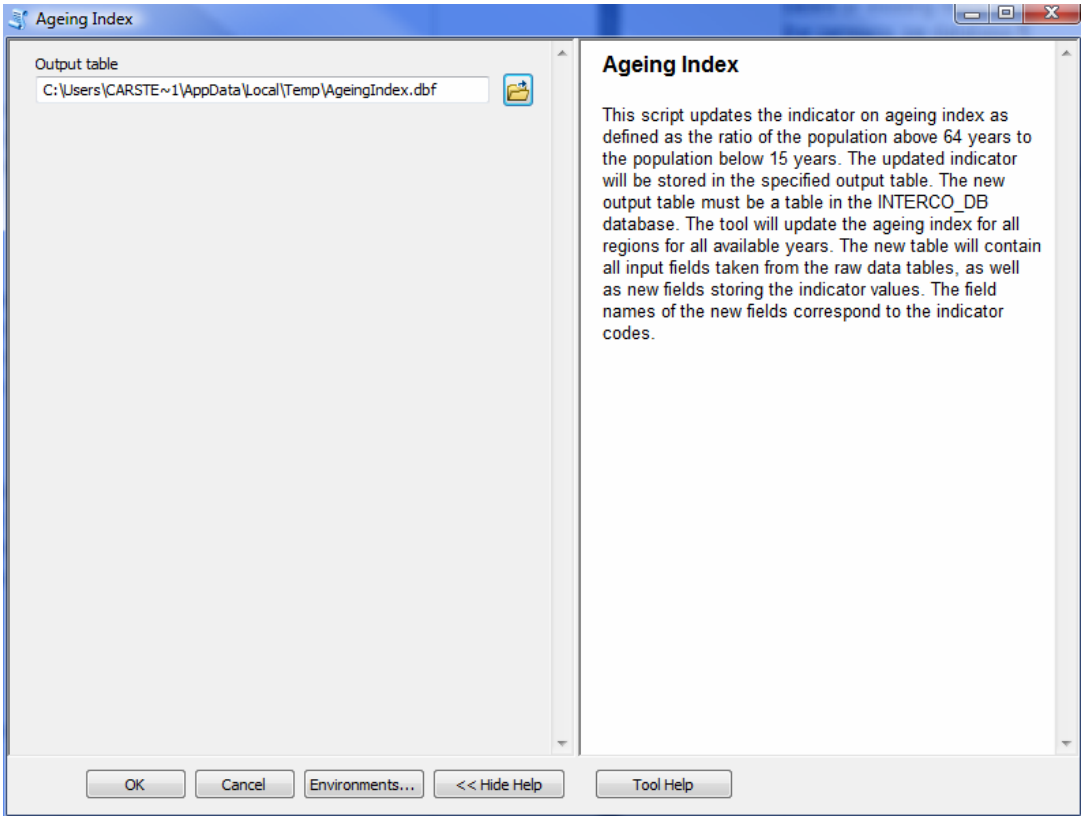

Figure 13. Tool – Ageing index.

Functionalities

This script updates the indicator on ageing index as defined as the ratio of the population above 64 years to the population below 15 years. The updated indicator will be stored in the specified output table. The new output table must be a table in the **INTERCO_DB** database. The tool will update the ageing index for all regions for all available years. The new table will contain all input fields taken from the raw data tables, as well as new fields storing the indicator values. The field names of the new fields correspond to the indicator codes.

Required user input

The user just needs to enter the name of the output table.

Output

A new table in the **INTERCO_DB** database with the name as specified by the user.

6.5.2 Cooperation intensity per capita

This tool calculates a specific cooperation indicator defined as number of cooperation projects per 100,000 inhabitants (Figure 14).

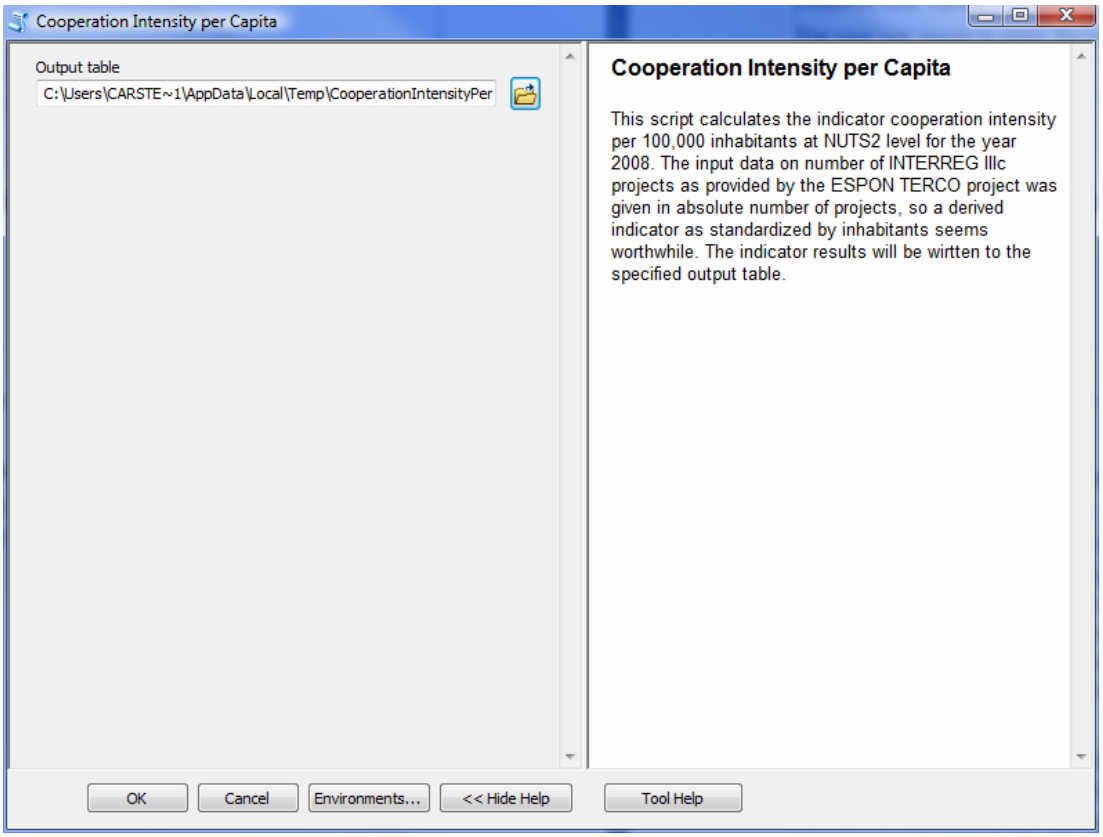

Figure 14. Tool – Cooperation Intensity per capita.

Functionalities

This script calculates the indicator **`cooperation intensity per 100,000 inhabitants`** at NUTS2 level for the year 2008. The input data on number of INTERREG IIIc projects as provided by the ESPON TERCO project was given in absolute number of projects, so a derived indicator as standardized by inhabitants seems worthwhile. The indicator results will be wirtten to the specified output table.

Required user input

The user just needs to enter the name of the output table.

Output

A new table in the **`INTERCO_DB`** database with the name as specified by the user.

6.5.3 Female-male unemployment rates

This tool re-calculates the indicator difference in female and male unemployment rates (Figure 15).

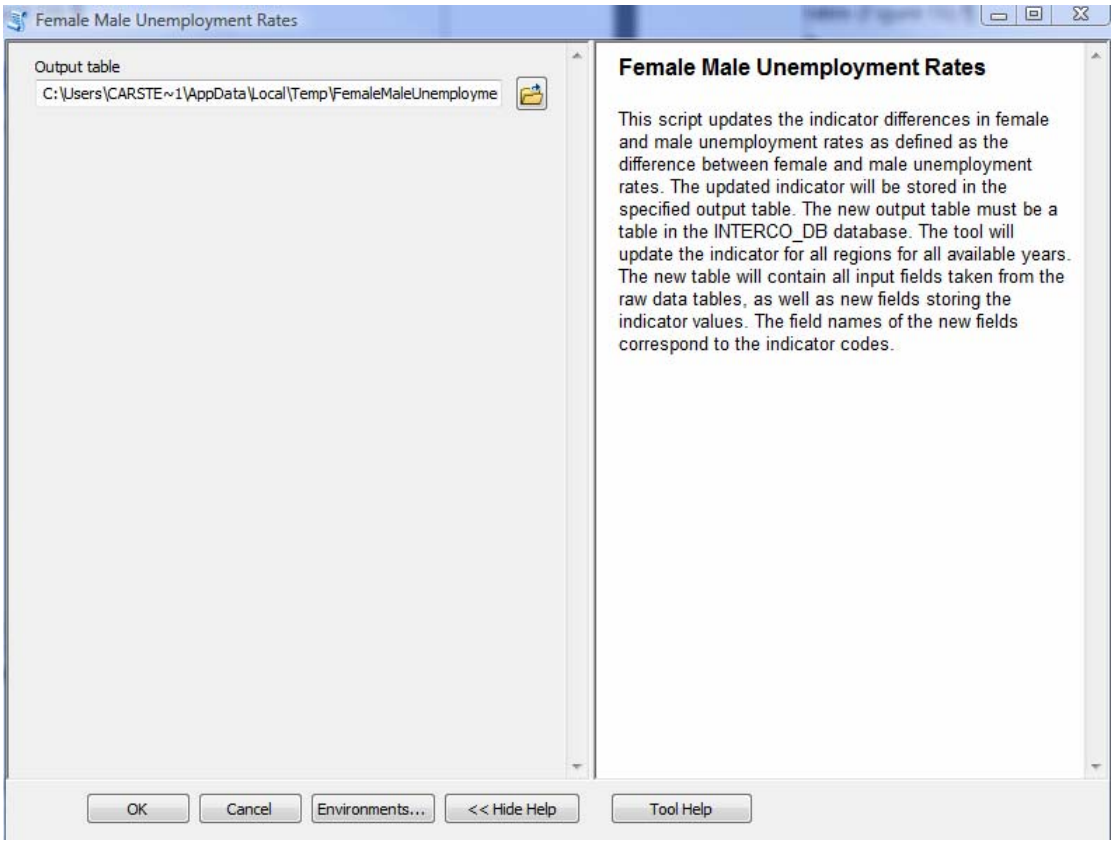

Figure 15. Tool – Female male unemployment rate

Functionalities

This script updates the indicator differences in female and male unemployment rates as defined as the female unemployment rate minus the male unemployment rate. The updated indicator will be stored in the specified output table. The new output table must be a table in the **INTERCO_DB** database. The tool will update the indicator for all regions for all available years. The new table will contain all input fields taken from the raw data tables, as well as new fields storing the indicator values. The field names of the new fields correspond to the indicator codes.

Required user input

The user just needs to enter the name of the output table.

Output

A new table in the **INTERCO_DB** database with the name as specified by the user.

6.5.4 Gender imbalances

This tool recalculates the indicator on gender imbalances (Figure 16).

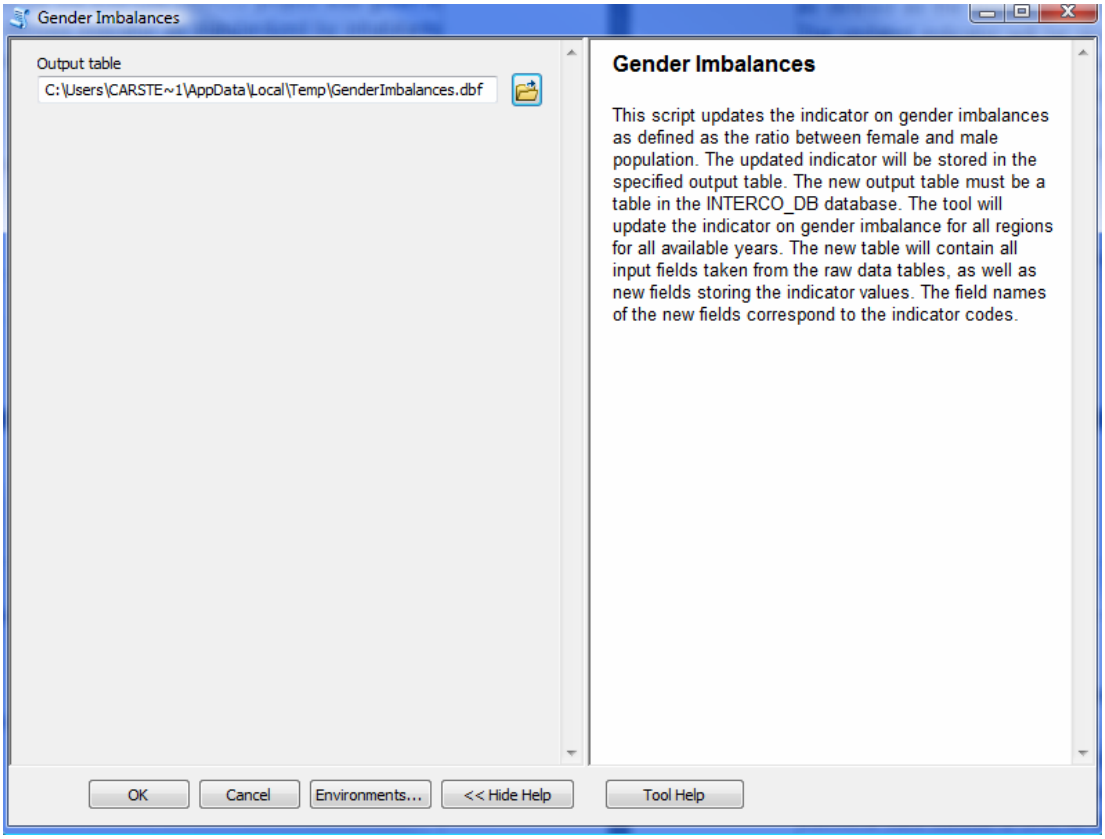

Figure 16. Tool – Gender imbalances.

Functionalities

This script updates the indicator on gender imbalances as defined as the ratio between female and male population. The updated indicator will be stored in the specified output table. The new output table must be a table in the **INTERCO_DB** database. The tool will update the indicator on gender imbalance for all regions for all available years. The new table will contain all input fields taken from the raw data tables, as well as new fields storing the indicator values. The field names of the new fields correspond to the indicator codes.

Required user input

The user just needs to enter the name of the output table.

Output

A new table in the **INTERCO_DB** database with the name as specified by the user.

6.5.5 Old-age dependency ratio

This tool recalculates the indicator on old-age dependency ratio (Figure 17).

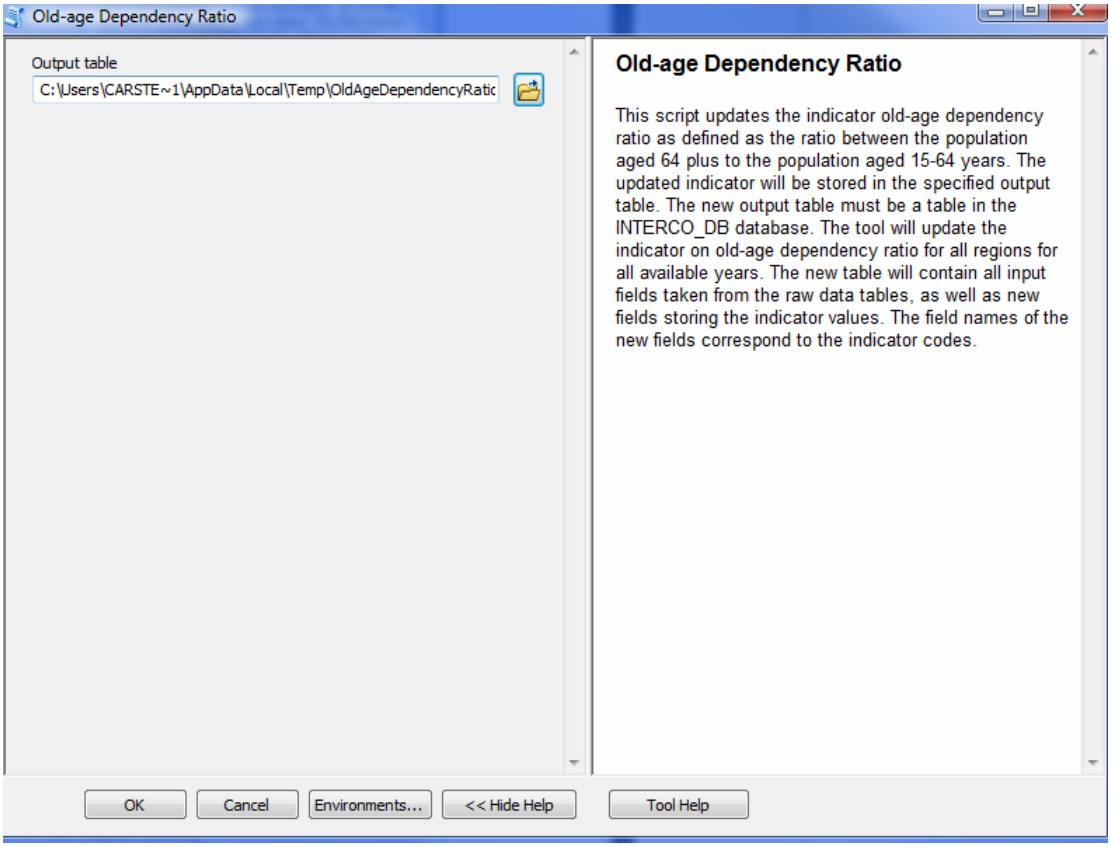

Figure 17. Tool – Old age dependency ratio.

Functionalities:

This script updates the indicator old-age dependency ratio as defined as the ratio between the population aged 64 plus to the population aged 15-64 years. The updated indicator will be stored in the specified output table. The new output table must be a table in the **INTERCO_DB** database. The tool will update the indicator on old-age dependency ratio for all regions for all available years. The new table will contain all input fields taken from the raw data tables, as well as new fields storing the indicator values. The field names of the new fields correspond to the indicator codes.

Required user input

The user just needs to enter the name of the output table.

Output

A new table in the **INTERCO_DB** database with the name as specified by the user.

6.5.6 Total population

This tool calculates the indicator total population (Figure 18). Although it was not selected as core territorial cohesion indicator, this information is used widely for many kinds of spatial analyses.

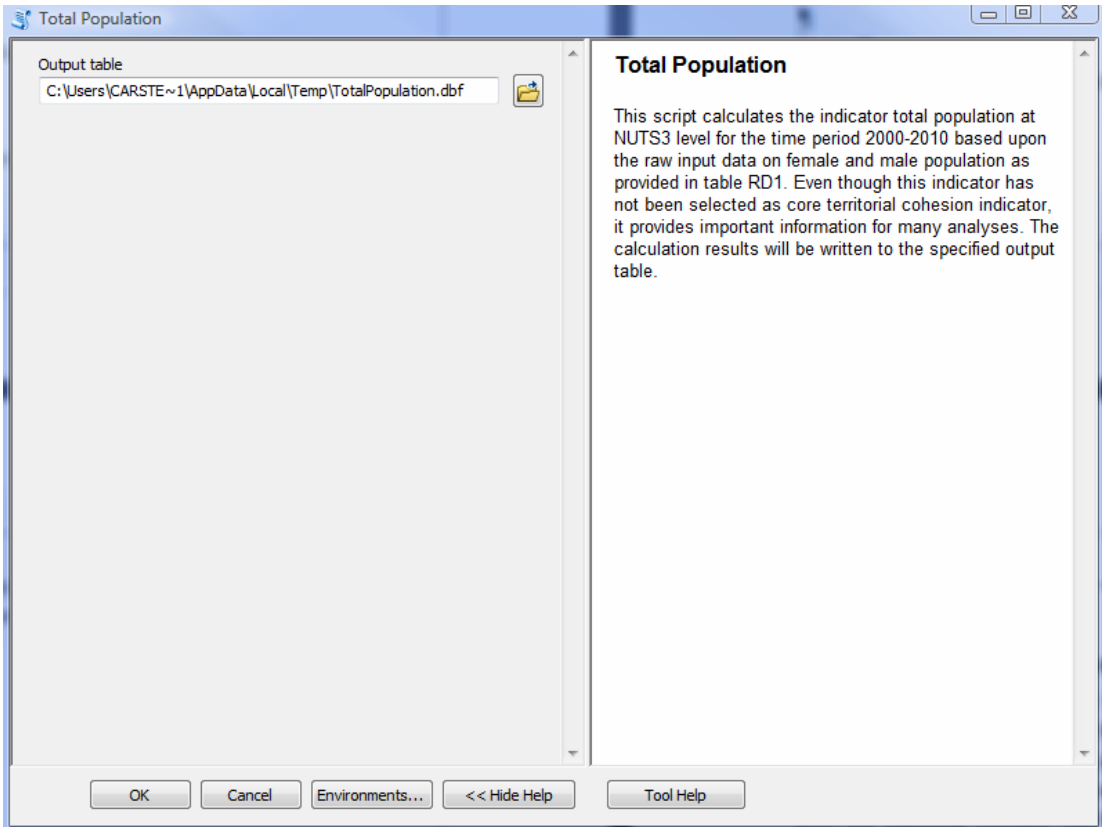

Figure 18. Tool – Total population.

Functionalities:

This script calculates the indicator total population at NUTS3 level for the time period 2000-2010 based upon the raw input data on female and male population as provided in table **RD1**. Even though this indicator has not been selected as core territorial cohesion indicator, it provides important information for many analyses. The calculation results will be written to the specified output table.

Required user input

The user just needs to enter the name of the output table.

Output

A new table in the **INTERCO_DB** database with the name as specified by the user.

7. Exchange files

7.1. Means of data exchange

The ArcGIS **INTERCO_DB** GIS database allows utmost flexibility in analysing, mapping and illustrating the territorial cohesion indicators. In order to allow none-GIS-specialists, or people without ArcGIS, or people who just want to work the statistical data outside a GIS, to work with the INTERCO indicators and output maps, both the statistical indicator numbers and the produced maps were exported from ArcGIS into widely used Excel file format (statistical data) as well as raster graphics format (**PNG** files) and vector graphics format (**AI** – Adobe Illustrator format).

The Excel files are stored in the **EXCEL** directory, while the **PNG** and **AI** files are provided through the **MAPS** directory. Both the **EXCEL** and **MAPS** directories contain a number of sub-directories, with one directory per territorial objective. All Excel files are provided in MS Office 2010 data format.

7.2. Excel files

The structure of the Excel files corresponds to the ESPON guidelines as developed by the ESPON Database project. There is one Excel file per indicator. Each Excel file has got four sheets, one sheet called **DATASET**, another one **INDICATOR**, a third one **SOURCE** and a fourth sheet called **DATA**. The latter one stores the actual indicator numbers, whith one column giving the numbers for one year.

By that both the actual indicator numbers as well as the associated metadata are provided through one file. The sheet **DATASET** gives basic metadata information, while the sheet **INDICATOR** provides the detailed indicator descriptions including methodology, units and available years. **SOURCE** illustrates the data source(s), and data lists the actual numbers.

The names of the Excel files correspond to the indicator names. Table 22 lists the available Excel files along with their file path.

Subdirectory	Excel file names
Access_to_Services	Accessibility_potential_air Accessibility_potential_rail Accessibility_potential_road
High_ecological_values	Ozone_concentration PM10_concentration Soil_sealing Vulnerability_Climate_Change
Innovative_territories	Employment_rates2064 Intramural_r&d_expenditures Tertiary_education
Local_economies	Gdp_per_capita(pps) Labour_productivity_industry_services Labour_productivity_persons_employed Old_age_dependency_ratio Unemployment_rate
Polycentric_development	Cooperation_degree Cooperation_intensity Net_migration Population_potential
Quality_of_life	Ageing_index Difference_female_male_unemployment_rate Disposable_household_income Gender_imbalances Life_expectancy_at_birth Proportion_early_school_leavers

Table 22. Available Excel files and their storage subdirectory.

7.3. Raster and vector graphic files

All indicator maps are exported from ArcGIS into **PNG** and Adobe Illustrator (**AI**) file format, i.e. raster format and vector graphics format, respectively. Both the **PNG** and **AI** files are provided through the **MAPS** directory. From there they can directly be viewed, retrieved and imported into reports, presentations or other documents; even for those users who do not have a GIS system at hand. The **AI** files can even more be further processed in any modern drawing software.

Like for the Excel files, the **MAPS** directory also includes a number of subdirectories correspond to the six territorial objectives of INTERCO. In addition there is subdirectory called **OTHER_MAPS** which provides extra maps generated for the local case studies.

The name of the graphic files include the full indicator code (see Chapter 9), plus the indicator name. Table 23 summarized the available map files.

Subdirectory	Graphic file names
Access_to_Services	0303accpotai2006n3rtd_accessibility_potential_air 0303accpotai2006n3rtd_accessibility_potential_rail 0303accpotai2006n3rtd_accessibility_potential_road
High_ecological_values	0801apozone_2008n3met_air_pollution_ozone 0801appm10_2009n3met_air_polluation_pm10 0803cch_vuln2011n3met_vulnerability_climate_change 0803soilseal2006n3met_soil_sealing_per_capita
Innovative_territories	0602teredu_2010n2rtd_tertiary_education 0602teredu_2010l2rtd_tertiary_education_scandinavia 0702rdexpim_2007n2rtp_intramural_expenditures_rd 0703emp2064_2009n2rtd_employment_rate 0703emp2064_2009l2rtd_employment_rate_scandinavia
Local_economies	0201oldagdr_2009n3rtd_old_age_dependency_ratio 0702labpris_2007n2rtp_labour_productivity_industry_services 0702labprpe_2010n0rtp_labour_productivity_person_employed 0702unemall_2009l2_unemployment_rate_scandinavia 0702unemall_2009n3rtd_unemployment_rate 0708gdpcap_2006l2met_gdp_capita_scandinavia 0708gdpeur_2006l2met_gdp_euros_scandinavia 0708gdppps_2008n3rtd_gdp_per_capita
Polycentric_development	0202netmigr_2007n3met_net_migration_rate 0909coopdegr2008n2met_cooperation_degree 0909coopint_2008n2met_cooperation_intensity 1002poppot_2008n3met_population_potential_50km
Quality_of_life	0201gendimb_2008n3rtd_gender_imbalances 0202ageind_2009n3rtd_ageing_index 0202ageind_2010l2rtd_ageing_index_scandinavia 0602earslea_2010n1etd_early_school_leavers 0603leab____0307l2met_life_expectancy_scandinavia_SE 0603leab____2008n2met_life_expectancy 0603leab____9807l2met_life_expectancy_scandinavia_DK 0702unemdiff_2010n2met_diff_female_male_unemp_rate 0703dihoinc_2007n2met_disposable_household_income 0703dihoinc_2010l2met_disposable_hosuehold_income_scandinavia_DK 0703dihoinc_2010l2met_disposable_hosuehold_income_scandinavia_SE
Other_maps	municipalities_scandinavia Population_density_2010_scandinavia Population_growth_2010_scandinavia urban_centres_scandinavia

Table 23. Available map files in their subdirectories (PNG and AI files).

8. Documentation

This user manual is provided in **PDF** file format on CD-ROM/DVD through the **DOC** directory. The **DOC** directory furthermore provides the indicator metadata through Annex 10 of the INTERCO Scientific Report, the indicator metadata document. The latter one allows to review the metadata without having to open each individual indicator Excel file.

Thus, the **DOC** directory includes the following two documents:

Annex10_Indicator_Metadata.pdf

Annex12_User_Manual.pdf (this document)

9. Indicator Coding System

9.1. Principles of the coding system

In order to allow a smooth processing of the indicators in the GIS and across different databases (INTERCO GIS Database, ESPON DB 2013, etc.), a unique INTERCO indicator coding system has been developed, which itself is based upon the TtOYS indicator coding system used in ESPON DB 2013.

The enhanced coding scheme for each indicator consists of six fields, of which five fields follow the original TtOYS structure, plus one additional field dedicated to store the indicator data type. Altogether the full code consists of 21 letters (combination of characters and numbers). The six fields are **`Category`**, **`Sub-category`**, **`Open field`**, **`Year`**, **`Space`** and **`Type`** (Figure 19).

Category		Sub-category		Open field							Year				Space		Type			
#	#	#	#	A	B	C	D	E	F	G	#	#	#	#	X	X	X	X	X

Figure 19. The INTERCO indicator coding scheme (TtOYS structure to code variables).

The fields **`Category`**, **`Sub-category`** and **`Space`** are filled with two characters each, the **`Type`** field with three characters, while the other two fields are more flexible. The **`Open`** field can take six to maximum eight characters and the field **`Year`** can take two up to four characters. To improve harmonisation, the ESPON DB instructions further proposed that letters and numbers should be written in a specific order and text displayed as either upper or lower case. The two pairs of digits representing **`Category`** and **`Sub-category`** are indicated in the first four characters of the code. The codes for the categories and sub-categories have already been presented in Table 1.

Beyond the categorisation provided in **`Category`** and **`Sub-category`**, it is necessary to give further details on the information that is being measured. This can be achieved by completing the **`Open field`**. In order to harmonise with other ESPON projects, the ESPON DB proposes three lists of abbreviations based on the current state of the database. The first two lists relate to subjects and to some adjectives and names widely used when labeling indicators (e.g. total, gender) and the third list should preferably remain fixed since it corresponds to measurement scales as recognised in the geographical/statistical literature.

In the **`Open field`**, upper case letters are used to identify the subject, up to three lower case characters are used to refine the subject and other lower case characters

by the proposed lists of ESPON DB are used. For instance, the overall unemployment rate is abbreviated as **UNEMALL** in the **Open field.**

The **Year** field stores temporal information about the indicator. Two cases can be distinguished: first, if an indicator is available for only one year, the full year is provided (like 2009). Second, if an indicator is available for a time interval of several years, the starting and the ending year of the period are given, both with the latter two numbers (e.g. a period of 2001-2008 will be abbreviated by 0108).

The **Space** field indicates the spatial level for which the indicator is available, as a two-digit code. The following abbreviations are possible (Table 24):

Abbreviation spatial level (2 digits)	Meaning
N0	Country level
N1	NUTS 1 level
N2	NUTS 2 level
N3	NUTS 3 level
N5	NUTS 5 level
L1	LAU 1 level
L2	LAU 2 level
UZ	Urban (morphological zone)
GR	Grid/raster

Table 24. Abbreviations indicating the spatial level in the indicator code.

The data **Type** field indicates the type of indicator in question. It is a three-digit field that stores one of the following abbreviations (Table 25):

Abbreviation data type (3 digits)	Meaning
INT	Interval
MET	Metric
NOM	Nominal
NOU	Nominal unique
NOD	Nominal dichotomous
NOC	Nominal categorical
NOG	Nominal graded membership
ORD	Ordinal
ORU	Complete ordinal
ORC	Classed ordinal
RTO	Ratio
RTE	Extensive ratio
RTC	Count ratio
RTD	Derived ratio
RDE	Density ratio
RTY	Cyclic ratio
RTP	Constrained ratio

Table 25. Data type abbreviations used in the indicator code.

The indicator codes need to be unique for each indicator. If there are two or more indicators with similar characteristics, the **`Open Field`** can be used to differentiate the indicator codes from each other.

9.2. Implemented in INTERCO geodatabase

The indicator coding system described above is not only used in the fact sheets for indicator identification, but the codes are also used in the **`INTERCO_DB`** geodatabase as column headers (field names) in the data tables (Figure 20). Since the indicator codes are unique, by way of consequence the column headers in the tables are also unique and distinctive. The benefit of using these codes in the database over using other names is their compactness and uniqueness.

However, since in ArcGIS a field name cannot start with a numeric value, the letter '**`I`**' (for indicator) preceed all the field names.

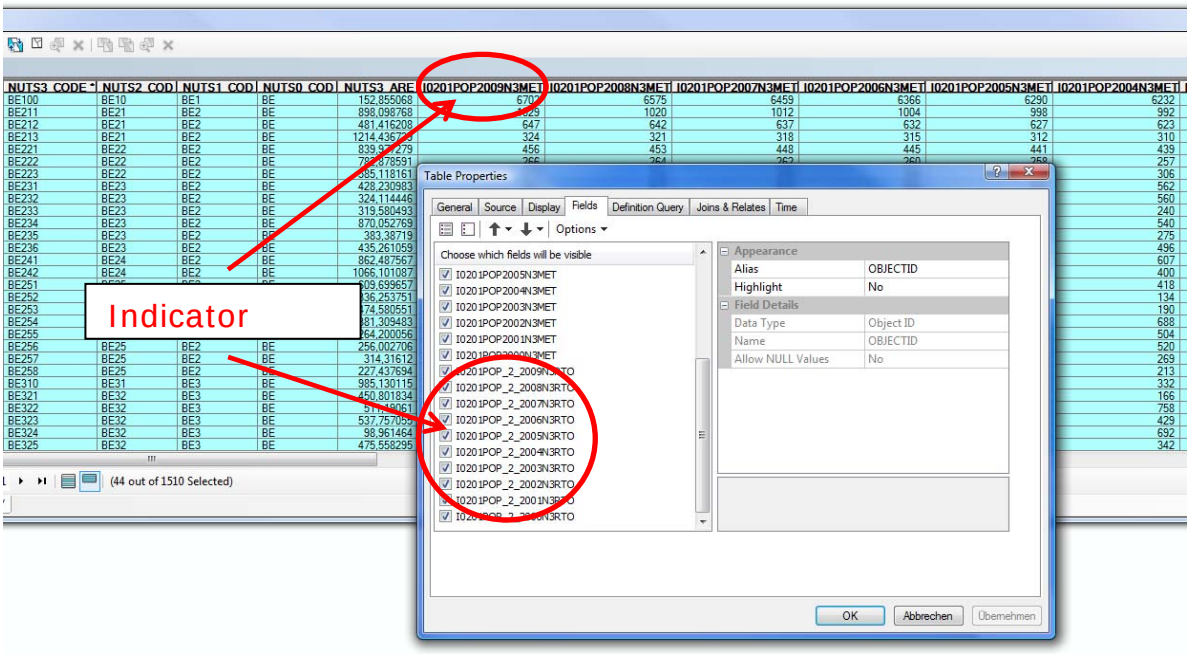

Figure 20. Indicator codes as field names in data tables of INTERCO_DB geodatabase.

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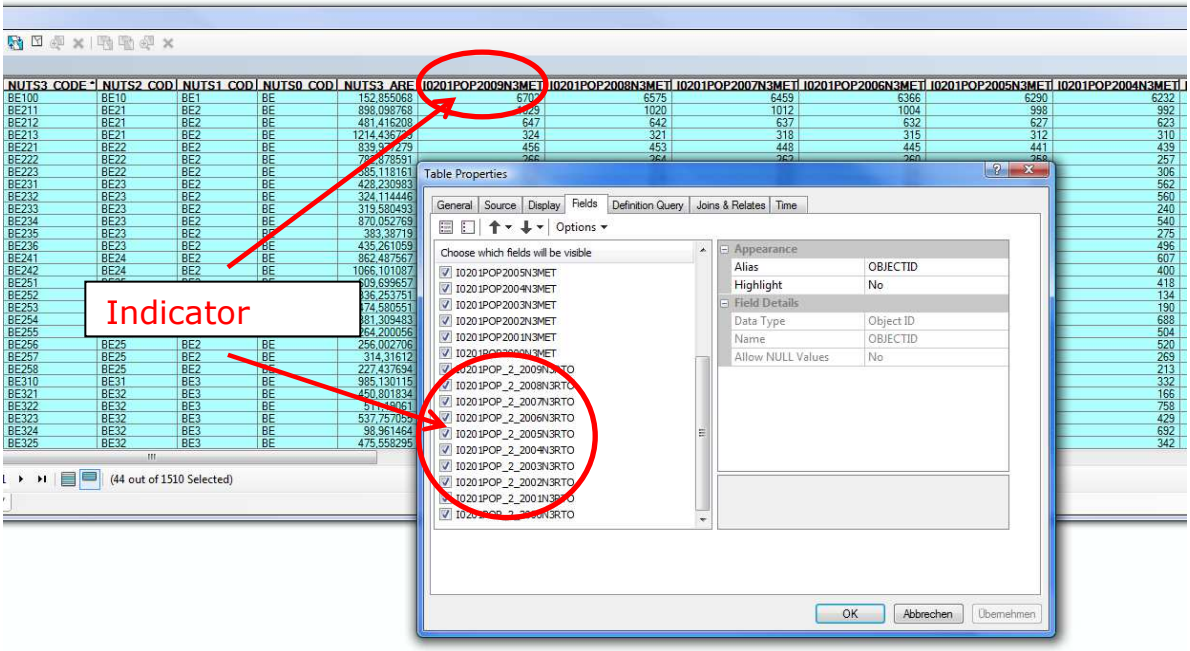

Figure 20. Indicator codes as field names in data tables of INTERCO_DB geodatabase.

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