Territorial change management at Eurostat and its support for comparisons in time in geographical analyses

Introduction

Eurostat, the statistical office of the European Commission, is responsible for the regional and local nomenclatures of territorial units within the EU and the candidates for accession to EU. The regional nomenclature, NUTS, is a hierarchical classification with three levels and it is governed by an EU regulation, which is directly applicable in the Member States of the EU. Below the NUTS are the Local Administrative Units, LAU, normally corresponding to communes, municipalities and similar local territorial units. In the field of urban statistics, similar territorial classifications are used.

An inevitable property of the regional, local and urban territorial nomenclatures is that they evolve over time due to changes in the boundaries. The frequency and volume of territorial changes vary from country to country. Because the statistical time series for the NUTS and the LAU will have breaks every time there is a geographical modification, Eurostat has faced the challenge to manage the regional and local nomenclatures, including their codifications, in order to produce statistics that is comparable over time.

The general principle at Eurostat is to keep statistical data only as long as the geography is stable. One code represents a unit with fixed limits – after a boundary change, a new code is created for the “new” unit. This may lead to many gaps in the tables. The presentation will cover the various solutions at Eurostat to cope with a dynamic geography at regional and local levels in all the Member States and candidate countries.

NUTS

The rules for how to update the NUTS regions are laid down in the Regulation on NUTS\(^1\). In order to keep stability in statistical time series, territorial modifications are not allowed more often than every 3 years. The only exception is if a country has a substantial reorganisation of the relevant administrative structure. Such amendments may be adopted at intervals of less than three years.

An important distinction is made between administrative regions and non-administrative regions. For administrative regions, the average population of a certain

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layer should lay within the thresholds in the table below. If a NUTS level consists of non-administrative regions, each region should be within the limits in terms of population.

<table>
<thead>
<tr>
<th>Level</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUTS 1</td>
<td>3 million</td>
<td>7 million</td>
</tr>
<tr>
<td>NUTS 2</td>
<td>800 000</td>
<td>3 million</td>
</tr>
<tr>
<td>NUTS 3</td>
<td>150 000</td>
<td>800 000</td>
</tr>
</tbody>
</table>

No other exact criteria exist, but the Regulation has a reference to geographical, socio-economic, historical, cultural or environmental circumstances, especially in the islands and outermost regions. Exceptions from the population thresholds may thus be made in duly justified cases.

Whenever NUTS regions are changed, the Member States are required to transmit statistical time series which are re-calculated to the new territorial breakdown. The length of these re-calculated time series vary with the statistical domain. One of the longest time series is required for demographic statistics, where the starting point is currently set to 1990. The methods for these re-calculations are to be decided by the Member State concerned. In this way, the regional statistical data disseminated by Eurostat are always referring to the current territory.

The NUTS Regulation was adopted in 2003 and now, three years later, Eurostat is busily working on the first 3-yearly review. Without going into details about forthcoming modifications in the NUTS which are not yet approved, it can be said that several countries have sent in proposals to Eurostat. We will enter a legal phase now, where the Commission makes an official proposal that has to be approved by comitology procedure, i.e. the Member States have to approve the amendment. The comitology is delegated from Council to the Statistical Programme Committee, where Eurostat and the NSO:s of the Member States are present. Once approved, the amended NUTS Regulation is directly binding for the Member States. A new review of the regional breakdown may be carried out in 2009 at the earliest.

**Local Administrative Units, LAU**

For the local administrative units (LAU), there is no EU regulation. Eurostat collects lists of LAU from the Member States every year. These lists contain the NUTS 3 code, the name and the national code of each LAU. They give a good overview of the detailed territorial organisation at one point in time. As these are snapshots, normally referenced to the beginning of the year, it is not possible to follow the evolution of the LAU in detail.

Since more than 10 years, Eurostat has another means to follow the LAU in detail. The statistical offices in the Member States are asked to report on all territorial
changes according to a specific file format, the CONC/MODA format. CONC stands for concordance and this is a file that links the LAU from the old situation to the new situation. MODA stands for modification and in this file, all LAU that have been modified one way or another are listed and the type of modification is indicated.

In Eurostat's treatment of the local nomenclatures it is sufficient with just a few types of modification. These are: name change; territorial closure; and territorial opening. A transfer of a small area between 2 LAU which both continue to exist after the modification involves a closure of both original units and then an opening of them after the change. With the logic in the CONC/MODA files, such a territorial transfer is reported on 4 records in the MODA file and 3 records in the CONC file.

The change management relies on special software (NPS, nomenclature preparation system) which is used to treat the CONC/MODA files as input files and to store the complete nomenclature history. Moreover, new codes are created by this software. Eurostat's principle is to create new codes for all LAU that have been subject to a territorial change.

The work to treat the CONC/MODA files and develop the new codes is outsourced to a private company, which is specialised on this type of work. It lies in the nature of the work that Eurostat's LAU codes are always lagging behind, as reports on the territorial changes are sent retrospectively from the Member States.

In practice, therefore, Eurostat is working with national LAU codes. These coding systems are very heterogeneous: the length may vary from 3 to 12 positions; the hierarchy of upper levels is included or excluded, depending on the country; and the principle for updating the codes varies from "always reuse codes" to "never reuse codes". Moreover, there may be different variants of national codes in different files and different national bodies may use completely different coding systems for the same set of local territorial units. This fact has caused Eurostat extra work when we have linked LAU codes from the national statistical offices with LAU codes from the national mapping agencies, as used in the digital map from EuroGeographics.

The statistical data held by Eurostat at the LAU levels consist mainly of tables from the population and housing censuses held every 10 years. Countries which do not hold traditional censuses any more compile similar data from registers or other sources. Given the fact that the data collections for the LAU are intermittent with very long intervals and that in most countries, there are numerous territorial changes between the decennial censuses, it is not practically feasible to make the LAU data exactly comparable from one census round to next. So in this case, no system is available at Eurostat for direct comparison over time.

**Urban Audit**

Finally, a few words about the change management in Eurostat's collection of urban statistics within the frame of Urban Audit. The Urban Audit holds data for 4 "periods" and a data for a fifth period will be collected in 2006-2007. Each period is centred on a reference year, which is the preferred year as follows:

- Period 1 – 1981
- Period 2 – 1991
- Period 3 – 1996
- Period 4 – 2001
- Period 5 – 2004
If data are not available for the exact reference year, data for a nearby year is accepted. For instance, the demographic data derived from the population census are from year 1999 for French cities, year 2000 for Estonian, Latvian and some other cities, year 2001 for cities from a large number of countries and year 2002 for Irish, Polish and Romanian cities. Information about the actual observation year or date is included in the data transmission. These data from 1999-2002 are all bundled together under "period 4" in order to make comparisons all over Europe.

The comparisons between periods are possible if the territory remains the same. There are some problems here if a city has annexed territory between the periods. Eurostat has accepted the data "as is", i.e. in this data collection, the city code has not been changed if the territory has been modified. For other spatial units in the Urban Audit, the old data are either suppressed and recalculated data are requested (larger urban zones, LUZ), or in the case of the neighbourhood (sub-city district, SCD) data, new codes are created and there is no link between old and new codes. Practical considerations have led to these pragmatic solutions of treating time-line data in the Urban Audit.
ANNEX. DESCRIPTION OF MERGER AND SPLITTING PROCEDURES

The examples below describe the procedures applied when local territorial units change. The procedures are an example of the way Eurostat's current software system treats these changes. They illustrate the procedure in the current change management system.

Codcom = code of the European Community
Codnat = code established by the national administration, normally the National Statistical Office.
Label refers to the name of the territorial unit

**Merger**

1. Closure
   - Close A's and B's codcoms
   - If C exists, close C's codcom
2. Opening
   - Create a new codcom for C
3. Links :
   - Match A's codcom with C's new codcom
   - Match B's codcom with C's new codcom
4. Codnat
   - Match C's new codcom with its codnat
5. Label
   - Match C's new codcom with its label

**Splitting**

1. Closure
   - Close C's codcom
   - If A exists, close A's codcom
   - If B exists, close B's codcom
2. Opening
   - Create a new codcom for A
   - Create a new codcom for B
3. Links :
   - Match C's codcom with A's new codcom
   - Match C's codcom with B's new codcom
4. Codnat
   - Match A's new codcom with its codnat
   - Match B's new codcom with its codnat
5. Label
   - Match A's new codcom with its label
   - Match B's new codcom with its label
Merger and splitting

1. Closure
   Close A’s, B’s, C’s and D’s codcom
   If X exists, close X’s codcom

2. Opening
   Create:
   - a new codcom for X
   - a new codcom for C
   - a new codcom for D

3. Links
   Match:
   - A’s codcom with X’s new codcom
   - B’s codcom with X’s new codcom
   - C’s codcom with X’s new codcom
   - D’s codcom with X’s new codcom
   - C’s codcom with its new codcom
   - D’s codcom with its new codcom

4. Codnat
   Match:
   - X’s new codcom with its codnat
   - C’s new codcom with its codnat
   - D’s new codcom with its codnat

5. Label
   Match:
   - X’s new codcom with its label
   - C’s new codcom de C with its label
   - D’s new codcom with its label