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The LAU2 Code

How to Analyse Regional Differences

1. Introduction

In designing the questionnaire and CATI instruments within the project "Job Mobilities and Family Lives in Europe," it was decided to pre-code the places where respondents live with a regional code LAU2. This meant extra work during the fieldwork because interviewers had to find the places their respondents mentioned on a list and translate them into an 8-digit number. However, once this work was done, the code enabled the researchers to include the aspect of region into the analyses comfortably. There are two aspects of region that could now be looked at: (1) Within each participating nation a number of regions (of almost any size, shape, and number) could be distinguished as a further level of geographical differentiation. (2) Certain characteristics of the region a respondent lives in could be taken into account: for example the regional unemployment rate or the region's urban or rural character.

This paper explains how one can get from the 8-digit number in the data-set to such analyses. It thereby summarizes information that is available to anybody at national statistical offices and at Eurostat, partly online, partly available on request. However, it shares information that needed several weeks of research, hoping to save other researchers with similar interests time and energy.

2. The code(s) for regions: NUTS and LAU

The code for regions in Europe comes in two labels: NUTS and LAU. NUTS stands for "nomenclature of territorial units for statistics." This is the elder label. LAU stands for "local administrative unit." What is called LAU1 and LAU2 today used to be called NUTS4 and NUTS5. So, LAU is only a specification of the two lowest levels of differentiation of the same regional code system.

However, there is a difference in the official recognition: Unlike NUTS, LAU1 and LAU2 are not (yet) legally defined codes. So far, the European NUTS agreement only defines the NUTS levels and asks nations to test the possibility of introducing a fourth and fifth level (which is done by defining LAU regions). This means that the LAU code is not yet fully internationally standardized, that it could still change in the future, and that the national statistical offices may not use them in their official statistics.

3. Hierarchical system

The NUTS/LAU code is organised hierarchically in 6 levels: from NUTS0 to NUTS3, followed by LAU1 and LAU2. Each level is a sub-division of the previous level, defining smaller regional parts within the larger regions of this previous level. Formally speaking, each level adds new digits to the numerical code. If you have your regions coded in LAU2 you can go to the higher NUTS levels with their larger and less differentiated regional classifications by dropping digits from the right.

One exception: LAU2 does define sub-regions of LAU1. However, (at least in Germany) LAU2 adds different digits to the NUTS3 code than LAU1 does, so it is not as easy to switch from LAU2 to LAU1 level.

Here a table introducing the six hierarchical levels of differentiation:

Level	Average size of regions	Example: Germany	Other examples
NUTS0	nation state	Germany	France, Spain, Poland, ...
NUTS1	3–7 million inhabitants	federal states ("Bundesländer")	Z.E.A.T. (F), Comunidades autónomas (E), ...
NUTS2	800 000 – 3 million inhabitants	administrative districts ("Regierungsbezirke")[1]	régions (F), Comunidades y ciudades autón. (E), ...
NUTS3	150 000 – 800 000 inhabitants	counties / county boroughs ("Kreise / kreisfreie Städte")	départements (F), provincias (E), ...
LAU1		municipalities associations ("Gemeindeverbände")	
LAU2		communities and cities ("Gemeinden")	Communes (F), municipios (E), ...

You can find a more detailed table, listing the regions for all EU countries and mentioning the number of regions that are distinguished on each level under:

http://ec.europa.eu/comm/eurostat/ramon/nuts/introannex_regions_en.html

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[1] In Germany there are 41 NUTS2 regions: 22 administrative districts in Baden-Württemberg, Bayern, Hessen, Nordrhein-Westfalen and Sachsen, 10 *former* administrative districts in Rheinland-Pfalz, Sachsen-Anhalt and Niedersachsen, and 7 smaller federal states, which are also own regions on the NUTS1 level, also mark entire NUTS2 regions. These are: Berlin, Bremen, Hamburg, Mecklenburg-Vorpommern, Schleswig-Holstein, Saarland and Thüringen.

4. Two different codes

Be careful if you are looking for the NUTS code! At least in Germany, there are two different codes that you might find for the same regions!

4.1. The Official Community Code ("Amtlicher Gemeindeschlüssel (AGS)")

The Official Community Code was developed by the EU member states. It therefore varies between the states. The codes for Germany are administrated by German Statistical Office ("Statistisches Bundesamt"). This is the code that the projet "Job Mobilities and Family Lives in Europe" used in its data collection.

> You can find the Excel tables telling you which place has which number, on the Eurostat website: http://ec.europa.eu/comm/eurostat/ramon/nuts/lau_en.html

4.2. NUTS code by Eurostat

The NUTS code by Eurostat is defined by the EU in legal agreements and by Eurostat. It was developed some time after the country specific codes. It is standardized for all EU countries.

It is not possible to say that one version of the NUTS code is better or more correct than the other. For international comparison the Eurostat code might be better to use, because it is standardized. However, the national version has the advantage that it goes down to the very differentiated LAU2 level (and not only zto NUTS3). And after all: one code can be transformed into the other.

5. Classification of the NUTS code by Eurostat

The NUTS code by Eurostat starts with a **2-letter country code (NUTS0)**. The code for Germany is: **DE**. The codes for the **federal states (NUTS1)** follow with **one digit**. They are listed alphabetically, and they include numbers as well as letters:

1 = Baden-Württemberg	**9** = Niedersachsen
2 = Bayern	**A** = Nordrhein-Westfalen
3 = Berlin	**B** = Rheinland-Pfalz
4 = Brandenburg	**C** = Saarland
5 = Bremen	**D** = Sachsen
6 = Hamburg	**E** = Sachsen-Anhalt
7 = Hessen	**F** = Schleswig-Holstein
8 = Mecklenburg-Vorpommern	**G** = Thüringen

The levels **NUTS2** and **NUTS3** also each add **one digit**. Here an example:

Code	NUTS0	NUTS1	NUTS2	NUTS3
DE	Germany			
DE1		Baden-Württemberg		
DE11			Stuttgart	
DE111				Stuttgart, Stadtkreis
DE112				Böblingen

> You can find a more detailed table, listing all NUTS0 to NUTS3 level regions for all EU countries under: http://ec.europa.eu/comm/eurostat/ramon/nuts/codelist_en.cfm?list=nuts

6. Classification of the Official Community Code

Theoretically, the Official Community Code starts with a **2-digit country code (NUTS0)**. However, these two digits are missing in the Excel tables on the Eurostat website that we referred to, because each table gives only codes for one nation. The code for Germany would be: **00**.

The rest of the code may vary between nations. In the German version (AGS), the numbers for the **federal states (NUTS1)** follow with **two numeric digits**. They are sorted geographically:

01 = Schleswig Holstein	**09** = Bayern
02 = Hamburg	**10** = Saarland
03 = Niedersachsen	**11** = Berlin
04 = Bremen	**12** = Brandenburg
05 = Nordrhein-Westfalen	**13** = Mecklenburg-Vorpommern
06 = Hessen	**14** = Sachsen
07 = Rheinland-Pfalz	**15** = Sachsen-Anhalt
08 = Baden-Württemberg	**16** = Thüringen

After these, the code for the **administrative district (NUTS2)** follows with **one digit**, and the code for the **county (NUTS3)** with **two digits**.

Unlike the European standardization, the national version of the regional code system adds further digits as **LAU codes**: The German AGS code, for example, adds another **four digits** to the NUTS3 level for **LAU1**, and **three digits** for **LAU2**. (This may be confusing because LAU2 is the more differentiated level.) The three LAU2 digits are also directly added to the NUTS3 code, *instead* of the four LAU1 digits. They are not added to the four LAU1 digits. Again, an example:

Code	NUTS0	NUTS1	NUTS2	NUTS3	LAU2
00	Germany				
0009		Bayern (Bavaria)			
00094			Oberfranken		
0009471				Bamberg	
0009471159					Memmelsdorf

You can find Excel tables for all EU countries, telling you which place has which number, on the Eurostat website: http://ec.europa.eu/comm/eurostat/ramon/nuts/lau_en.html

7. Breaking it down: How to read the numbers in your data-set

Unfortunately, we, the authors of this paper, do not know *for sure* how to read the code in other countries, but Germany. As mentioned before: Only the Eurostat version of the NUTS code is standardized. If your country uses the same system as Germany, then you have an 8-digit number in your data-set for each LAU2 region, and here is how you read it:

Digit	Code level	Type of region	Equivalent in other countries
1 + 2	NUTS 1	federal states	Z.E.A.T. (F), Comunidades autónomas (E), ...
3	NUTS 2	administrative districts	régions (F), Comun. y ciudades autón. (E), ...
4 + 5	NUTS 3	counties / county boroughs	départements (F), provincias (E), ...
6 – 8	LAU 2	communes and cities	Communes (F), municipios (E), ...

8. Using the LAU2 code for data-analysis

There are two basic strategies how one can bring in region into statistical analyses, using the LAU2 code.

First of all, you might want to **differentiate your results by region**, distinguishing a few large regions within your country. For Germany this might be East versus West Germany or the 16 Bundesländer. For Belgium this might be Brussels, the Flemish part, and the Walloon part. For this purpose you should calculate a new variable, going from the LAU2 level to the less differentiated NUTS1 level. If your LAU2 code looks like the German one (8 digits, with NUTS1 occupying digits 1 and 2) the following SPSS command does the job:

```
COMPUTE nuts1 = TRUNC(lau2/1000000).
EXECUTE.
```

And if that is still too differentiated you can continue with a RECODE command, like the following, turning the 16 German Bundesländer into a binary index for East versus West Germany:

```
RECODE nuts1 (1 thru 10 = 1) (11 thru 16 = 2) INTO eastwest.
EXECUTE.
```

A second approach is to include some of the **characteristics of the region** a respondent lives in **as meso level context variables** in your analyses. You might, for example, want to see whether the rural or urban character of a region, the percentage of Roman Catholics, or the regional unemployment rate have an effect on the respondent's behaviour. For this purpose you need extra information about each region (e.g. which region is rural, which is urban, what are the regional unemployment rates, ...) that you cannot find in your data-set (yet). Usually, the statistical offices collect and provide such regional statistics. The German statistical office, for example, provides free information about the size of each LAU2 region in square kilometres, the number of inhabitants it has, and an index with three categories, distinguishing municipal (1) from half-municipal (2), and rural (3) regions. You should be able to get such information in Excel tables that list all LAU2 codes in one column and, next to it, relevant statistics regarding the region that this code stands for.

9. How to get information about regions into the data-set

Assuming we want to include some of the characteristics of the region a respondent lives in as meso level context variables in your analyses, and assuming we found statistical information about regions as Excel tables at our national statistical office – how do we get such information into the data-set? Here an instruction in eight steps.

Step 1: Open an empty SPSS data window.

Step 2: Look at the columns in your Excel table, note for each of them whether they make numeric or string variables, and how many digits each needs. Go to your SPSS data window and format each variable appropriately: In the example below the first variable is numeric and needs 8 digits, the second one needs to be a string variable with something like 40 digits, the third one is numeric and needs to have two digits behind the dot or comma, etc.

Step 3: Copy the data from the Excel table into the SPSS data matrix and save that, for example under the name "regions.sav." This is simply done by marking all the cells in the Excel table, clicking on "copy," switching to the SPSS data window, left upper cell, and clicking "paste."

Step 4: Finish the formatting of your variables: Give all variables meaningful names, add variable and value labels, and define missing values (if you have any). Make sure that the variable with the LAU2 code in your new data-set regions.sav has *exactly* the same name and formatting as the LAU2 variable in your JobMob data-set! Make sure that all other variables in regions.sav have names that do not exist in your JobMob data-set.

Step 5: Sort your new data-set regions.sav by LAU2 code (see the SPSS command below). Save it.

```
SORT CASES BY lau2 (A).
```

Step 6: Open your actual JobMob data-set. Sort it by LAU2 code (same command). Save it.

Step 7: Match the two files, with your JobMob data-set being open, using the following command. Make sure that in the line "tables = ...," before the file name "regions.sav," you insert the precise name(s) of the folders and sub-folder where "regions.sav" is stored on your computer.

```
MATCH FILES /FILE = *
            /TABLE = "C:\ [add folder name(s)] \regions.sav"
            /BY lau2.
EXECUTE.
```

Step 8: Save the result under a new name. Done!

10. Instead of a Bibliography: Where to find more information

The best source of information is the "regions" website of Eurostat:

http://ec.europa.eu/comm/eurostat/ramon/nuts/splash_regions.html

For more detailed information, the national statistical offices are likely to help. In Germany, the statistical office ("Statistisches Bundesamt," www.destatis.de) provides, for example, statistical data for specific regions, entered one at a time by LAU2 code or name of community:

http://www.destatis.de/jetspeed/portal/cms/Sites/destatis/Internet/DE/Content/Statistiken/ Regionales/Geimeindeverzeichnis/Gemeindeverzeichnis__htm,templateId=renderPrint.psml

Die Suche im Gemeindeverzeichnis mit - AGS:01001000 - brachte folgende Ergebnisse	
Stand	31.12.2005
Bundesland	Schleswig-Holstein
Regierungs-Bezirk	
Kreisname	Flensburg, Stadt
Amtl.Gemeindeschlüssel	01001000
PLZ Gemeindenamen	24937 Flensburg, Stadt
Gemeindetyp	Kreisfreie Stadt
Anschrift der Gemeinde	Flensburg, Stadt
Straße	Rathausplatz 1
PLZ Ort	24937 Flensburg
Fläche km2	56,38
Einwohner gesamt	86080
Einwohner männlich	41968
Einwohner weiblich	44112
Einwohner je km2	1527

The data that is available online is from 2005. More up-to-date data can be ordered online:

https://www-ec.destatis.de/csp/shop/sfg/bpm.html.cms.cBroker.cls?cmspath=struktur, sfgsuchergebnis.csp&action=newsearch&op_EVASNr=startswith&search_EVASNr=1191

Each country specific review is following a shared structure of aspects that were considered relevant: Reported literature either investigates on occupational spatial mobility as such. Or it investigates motility, as a concept of the ability to become mobile, including the infrastructure for mobility in a given country. Or it links mobility to one of four fields that were assumed to strongly interact with mobility: family, job market, social integration and social capital, or quality of life.